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Mr. Jim Wright
Chairman, Council of Principals
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Dear Mr. Wright:

On behalf of the Instructional Development Advisory Committee, I am pleased to forward to you this Overview of the report on teaching reading, critical thinking, and writing in all subject areas. It is an abridged version of the full report entitled Meeting New Challenges Across the Curriculum. Anticipating that this Overview will be given wide distribution within the post-secondary system, we have included a copyright release statement.

The members of my committee and the Instructional Development Advisory Committee very much appreciated the encouragement and support received from the Council of Principals and Ministry of Advanced Education and Job Training in permitting this project to proceed.

Meeting New Challenges Across the Curriculum is the result of an extensive review of the available literature and related practices across North America. The status of "across the curriculum" activities in British Columbia was determined through the use of a survey. The response from the field was very positive. This suggests that, with the continued support of the Council and Ministry, projects will be initiated to address the reading, writing and thinking skills of our graduates.

The report recommends that a multi-layered commitment be made to support a variety of projects in support of reading, critical thinking, and writing in all subject areas in our colleges and institutes. It suggests many alternatives which can be considered by individual institutions in addition to provincial initiatives. It is expected that Meeting New Challenges Across the Curriculum will serve as a needed catalyst.

Yours truly,

Ruth D'Hollander

MEETING NEW CHALLENGES ACROSS THE CURRICULUM: AN OVERVIEW

BACKGROUND OF THE PROJECT

In Fall 1986, the Council of Principals identified the development of human resources as a priority, and in January 1987, established the Instructional Development Advisory Committee (IDAC) to complement the work of the Management Development Advisory Committee. IDAC was asked to examine issues related to instructional development in the British Columbia colleges and institutes.

Among the many areas IDAC identified as warranting attention was the challenge educators face in preparing their graduates for successful living and employment in an information age society. In light of the wide array of learning problems that students present when they come into our colleges and institutes, helping them become better writers, thinkers, and readers appears to many teachers as an overwhelming challenge. To this end, instructors in a variety of subject areas are working to help students become better readers, writers, and thinkers. IDAC decided to look more closely at this trend and to investigate the advisability of endorsing and supporting such an approach. The Council of Principals, on behalf of IDAC, requested and received Ministry funding in January 1988 for this investigation into meeting the challenge of teaching writing, critical thinking, and reading "across the curriculum".

The mandate given to this project was to

- (a) summarize current research and literature about the relationship between student achievement and subject-based teaching of writing, thinking, and reading skills;
- (b) describe the present status of writing and critical thinking across the curriculum in our colleges and institutes;
- (c) describe a selection of successful program models outside the province; and
- (d) describe alternatives for instructional development opportunities in individual institutions as well as across our college and institute system.

The process of preparing this report has consisted of a review of current literature based on ERIC searches and suggested readings from professionals in the field; direct contacts with teachers and directors of programs via phone, mail, and arranged meetings; and attendance at a few selected conferences. Questionnaires were mailed in March 1988 to Deans of program areas at the colleges and institutes in British Columbia to gain a sense of the status of reading, writing, and critical thinking across the curriculum in the province. Fifteen institutions responded with a total of thirty-eight responses. An additional critical thinking questionnaire was sent to students in critical thinking courses in selected British Columbia colleges and universities.

The findings contained in this report are by no means exhaustive. Specific instances of successful programs are illustrative only and are not intended to represent all those in place or even all those made available to the researchers.

Many excellent teachers are effective catalysts for student learning. They are committed to increasing students' desire and ability to learn, to be effective readers, communicators, and problem-solvers. Their long-term aim is to help students become lifelong learners, successful wage-earners, and responsible citizens. The goal of this project is to begin or, as the case may be, to continue the conversation throughout the British Columbia college/institute system about learning theory and teaching practices which have been successful in making subject specialists better teachers and students better learners. If the recommendations at the conclusion of this report are acted upon, it is expected that these exceptional teachers will have the opportunity to share their successes with interested colleagues and thereby enhance student learning on a wider scale throughout our province.

INTRODUCTION

Challenges

How to improve students' reading, critical thinking, and writing skills to enable them to participate fully in our pluralistic society and democratic system of government is only one of the broad challenges facing our educational system today. Rapidly evolving needs of the workplace are also presenting challenges to our information age post-secondary institutions. The Occupational Outlook for British Columbia and the Yukon as described by Employment and Immigration Canada stresses increasing needs for analytical and communication skills on the part of all workers (Farris, 5, 16). In a recent report to the United States Department of Labour, the Hudson Institute states that "between now and the year 2000, for the first time in history, a majority of all new jobs will require post-secondary education" (Johnston xxvii). The Hudson Institute report indicates a direct correlation between level of skills required and the rate of growth of employment in an occupation. Furthermore, it says "technology will introduce change and turbulence into every industry and every job. In particular, the necessity for constant learning and constant adaptation by workers will be a certain outgrowth of technological innovation".

Colleges and institutes, along with secondary schools, are on the front line, required to meet the challenge for improving the reasoning and communication skills of students. In these times of economic instability, two-year post-secondary programs are becoming increasingly significant. Students, less able to commit themselves to long educational programs, look to the colleges and institutes to meet their educational needs. Moreover, the

open-access policy heightens the challenge for post-secondary educators as they now cope with larger numbers of students who lack adequate language and study skills. Increasingly, more mature students are returning to school and learning disabled students are seeking post-secondary educational opportunities. Many of these require academic and personal support to achieve success at college and present a wide range of instructional problems for faculty. This growing challenge now requires all teachers and departments to share responsibility for helping all types of students to learn more effectively in their courses.

Many instructors lack the specialized skills to face these challenges effectively. Few have been trained to teach writing (Gray 35) and almost none to teach reading and critical thinking. A traditional response is for institutions to pass the responsibility for improving students' writing, reading, and critical thinking skills over to English and Communications Departments, Reading and Study Skills Centres, and Philosophy Departments. While the courses offered in these areas are important and have definite merit for those able to participate, experience has shown that limiting language and critical thinking instruction to them is not enough. The burden of improving students' skills needs to be shared by teachers in all disciplines, across all curricular areas.

The Quiet Revolution in Teaching

Since the 1970s, as new knowledge about the nature of learning has spread to teachers in all disciplines, many subject specialists across the continent have already responded to these challenges. They have sought and found ways to improve student learning and expressive competence within their own courses. These attempts have become known as the "quiet revolution" (Griffin 1), often based in "writing across the curriculum" programs, but not exclusively. There has been a shift in education away from the notion that students are "empty vessels" to be filled with knowledge imparted by the teacher towards emphasis on helping students learn how to learn and on teaching higher-order cognitive skills such as problem-solving, analytical reasoning, and critical thinking (Rousseau 2). These teachers are devising instructional approaches which take into account that students become expert in subjects by using the language of the subject, by talking, thinking, reading, and writing about it.

Nature of Learning and Teaching

The seeds of this “quiet revolution” were sown through the early work of Piaget in cognitive development and of Vygotsky in language and thought. They took root in the 1960s as research developed along three main lines:

- studies of language interactions in secondary classrooms (Barnes; Britton, “Talking”);
- development of student-centred, process approaches to learning;
- research of cognitive psychologists.

As a result of investigations, learning is now described as a **multi-faceted, complex interaction between learner, teacher, knowledge domain, and situation, with language playing a crucial role as the principle instrument of interaction.**

Implicit in this interactive view of learning is the importance of the learner’s background to the learning process. Also important is the learner’s active involvement with the topic as he restructures new information in terms of existing knowledge. Motivation, attitudes, interests, beliefs, and values also play their role in learning. Much of the research in language and learning theory points out that teachers need to see themselves as coaches, not lecturers, who balance instruction in both process (how to read, write, and think) and content (curriculum). How to balance formal instruction with the need for classroom discussion and informal writing which allow students to explore and reflect upon their learning are issues that have faced teachers for a long time. Although the dilemma prevails concerning the balance between “covering” content and “uncovering” knowledge, this balance can be facilitated by instructional design and by attention to making appropriate process decisions on the basis of the particular content to be learned.



READING AND LEARNING FROM TEXT

In the past, post-secondary educators have assumed that college students possess all the skills necessary to learn efficiently from assigned texts. Thus, little has been done other than to prescribe a text, require that it be read, and test for results. Now, however, new perspectives on learning from text are challenging this traditional assumption. Researchers into reading are developing new instructional strategies that facilitate learning from text and develop more independent and efficient learners.

Just as writing is now perceived as a recursive process, so is reading an interactive and constructive process (Duffy 3-7). Complicated linguistic and psychological processes enable mature readers to draw upon prior knowledge, memory, language fluency, and text structure to learn from reading. Learning from text requires that the reader recognize and use hierarchical relationships within the text that organize the content in terms of major and supporting concepts (Alvermann 38-51). To sort these out and understand the text, the reader must be sensitive to the patterns and cues that carry and reinforce meaning. At times, the focus may be on vocabulary; at other times the focus may be on the relationships between words, or the syntax. Patterns or the organizational flow of key concepts may also contribute to comprehension. The reader's search for meaning is not linear but dynamic, drawing on all available text features. Accordingly, comprehension is **inhibited** when too few cues are recognized or employed. Comprehension is **facilitated** when instruction heightens the reader's sensitivity to all features of the text.

Educators agree that effective teaching requires strategies which make students independent in text learning (Singer and Donlan). If post-secondary education is to prepare students better for the changing future, such independence is important. Teachers need to pay attention to methods of improving comprehension as well as to the mastery of specific content.

A review of the current literature shows that little occurs in post-secondary classrooms to facilitate text comprehension and concept formation (Conley and Murphy 14-24). Appropriate methodology has, however, been developed by Reading and Study Skills specialists, and this methodology would be even more effective in the hands of the content instructor. Content teachers, given the opportunity to learn how to integrate reading instruction with content instruction, are the best ones to teach students how to learn from text.

CRITICAL THINKING INSTRUCTION

Purposes of Critical Thinking Instruction

The tradition of argument in favour of critical thinking instruction divides into two main streams:

- its role in improving academic performance, and
- its role in promoting "good citizenship."

Under the first heading, critical thinking instruction should enable students to develop such reasoning skills as problem-solving, generalization, argument analysis and evaluation, as well as those of successful communication through reading and writing. Essential is the concept of the student as an **independent** thinker within a **community** of thinkers bound by a consistent approach. Critical thinking instruction encourages students to adopt a **critical** attitude to the material they are confronted with, and to evaluate it within the **conventional** limits of appropriate methods of reasoning. This view of the purpose of critical thinking instruction connects it closely with the ideal of "learning to learn" and argues for its necessity in all areas of the curriculum.

Under the second heading, it is argued that the independence of thought fostered by critical thinking is morally necessary to citizens in a democracy (Glaser; Sabini). It can also be agreed that critical thinking instruction fosters a whole host of specific skills helpful to participation in contemporary society.

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History of Critical Thinking Instruction

Critical thinking is essentially concerned with reasoning. Critical thinking instruction, in its broadest sense, has always been a component of enlightened post-secondary education in which an emphasis is placed on rational analysis and independence of thought. Over the last twenty years, a conscious effort has arisen to channel less systematic attempts into a coherent, organized, and self-aware approach to the development of higher-order thinking abilities. The recent history of critical thinking instruction has produced a variety of methods and a lively debate within the field on a number of important pedagogical issues. Originally, great emphasis was placed on free-standing critical thinking courses. Significant connections are now becoming apparent between the goals of critical thinking as a discipline and those of other academic disciplines, resulting in a growing sense of the need to teach critical thinking across the curriculum.

Issues in Critical Thinking Instruction

Critical thinking instruction is a live, developing field. Some of the motivations for this expansion arise from the demand for critical thinking across the curriculum. As a result, the solutions to pedagogical problems are not found in a single, simple formula. Differences of emphasis, interpretation, fact, and value must be examined to give an adequate picture of the field. The complete Meeting New Challenges Across the Curriculum report looks at the relations between creative and critical thinking, between holistic and technical approaches to critical thinking, between instruction which is self-conscious about thinking processes and that which is not, and between domain-specific and domain-independent aspects of critical thinking.

This last issue is crucial to justify the teaching of critical thinking across the curriculum. Some theorists have argued that it is impossible to divorce critical processes from the content-domain in which they are applied, that critical thinking abilities are not transferable to other areas of discourse, and that critical thinking skills should be taught only within content-courses. In contrast, the philosophical tradition of logic has always assumed that critical thinking is a formal matter which does not rely on specific content. The position taken in this report is that the truth lies somewhere between these two extremes. Critical thinking may be imagined as an octopus, whose arms extend into all areas of human inquiry but whose head is the concentration

on the general forms of reasoning available in a critical thinking course. Without the arms, the head will die for lack of food; but without the head the arms cannot live.

Critical Thinking Across the Curriculum

The above discussion of the nature of and issues within critical thinking yields two lines of justification for instituting critical thinking instruction across the curriculum. They are concerned with a) general reasoning abilities, and b) discipline-specific abilities and understanding of subject matter.

General Reasoning Abilities

One basic rationale for critical thinking instruction is that it is an important preparation for life. Critical thinking across the curriculum helps students realize the universal need for critical thinking by making sure it is recognized and employed throughout their academic experience.

A further reason for complementing specialized critical thinking courses with critical thinking instruction across the curriculum is that ultimately it allows for deeper analysis of problems and exploration of solutions. A suitably trained instructor of a particular subject may be able to pursue issues further than a critical-thinking specialist. The habit of rigorous thinking might thus be maintained and transferred to other areas of the student's experience. Cognitive science research, as well as a number of programs currently in operation, strongly suggest that the same critical thinking processes lie behind reasoning in many educational contexts, both in the strictly academic and in the vocational (Resnick). The more critical thinking is learned across the curriculum, the greater will be the opportunities for successful transfer.

Another strong and simple argument for incorporating critical thinking instruction across the curriculum is that successful reading and writing clearly mean thinking critically about what is read or written. The more students are provided opportunities to engage in these processes in meaningful contexts, the more they will benefit.

Discipline-Specific Abilities

The argument under this heading for critical thinking instruction across the curriculum derives primarily from the extent to which some critical thinking and reasoning abilities are domain-specific. In so far as one of the main purposes of critical thinking instruction is to enhance performance in academic and vocational disciplines, the incorporation of across-curriculum instruction seems to be required. Again, depth in understanding the nuances of appropriate reasoning within a discipline is the main advantage which a

properly trained discipline instructor has over a critical thinking specialist (Resnick; Daly). The disadvantage is a comparative lack of self-conscious familiarity with the details of critical thinking abilities, which is why the maintenance and expansion of free-standing courses is also important.

Critical Thinking in the Classroom

Although lecturing can form a part of critical thinking instruction for imparting basic techniques and background explanations, it is not the predominant form of activity. Interactive work on examples, group work, debate, and verbal discussion are of paramount importance. Critical thinking instruction is

- Dialogical, involving discussion between students, and between them and the instructor.
- Student-centred, enabling each student to build on native abilities.
- Collaborative, involving students working with each other and sometimes with the instructor.
- Active, building familiarity with the techniques, concepts, and habits of critical thinking through use and practice.
- Metacognitive, making the student aware of the processes and abilities to be gained through this form of instruction.
- Reflective, insisting on the justification of taking a critical stance.

Programs For Critical Thinking Across the Curriculum

The survey of program models elsewhere in North America, in addition to the examination of the situation in British Columbia, makes it clear that the development of college curricula is proceeding, albeit unevenly, in the direction of increased emphasis on critical thinking instruction. In this movement towards establishing educational practices to accomplish the goals of such instruction, critical thinking across the curriculum is coming to be seen as the necessary extension to instruction already supplied in free-standing critical thinking courses.

While there is a considerable amount of interest in and perceived need for the introduction of critical thinking across the curriculum at the post-secondary level, the description of actual programs in British Columbia is rather short. There have been some informal attempts, mostly on the initiative of individual instructors to incorporate critical thinking across the

curriculum. Many of these informal attempts to include a critical thinking component in non-philosophical courses are in the area of adult basic education. The British Columbia Association for Critical Thinking Instruction and Research carries on a lively theoretical discussion, coupled with the examination of practicable strategies, in the area of critical thinking across the curriculum.

Existing Program Models

In the following section, attention is given to possible models for developing critical thinking across the curriculum in British Columbia.

Tandem Course Model

In this model, free-standing critical thinking courses are paired with specific-content courses across the disciplines. Students who enroll in the program take a course whose content and methods of instruction are closely coordinated with those of a critical thinking course which they take concurrently. Instructors participating in this model point out the need for faculty time-release in order to start such a program.

Faculty Development Model

In this model, attempts are made to introduce critical thinking instruction through professional development for faculty. The goal is for participating faculty to increase the critical thinking component of their own courses, and so increase student achievement in this area. To be effective, this model needs coordinated institutional curriculum planning along with the professional development opportunities.

Integrated Course Model

This model incorporates a combination of critical thinking courses and critical thinking approaches within content-courses. There is an ongoing integration of theoretical research, curriculum planning, pedagogical practice, professional development, and program assessment. The mutual reinforcement of all of these factors is what makes this the most highly developed, comprehensive, and successful instance of critical thinking across the curriculum.



WRITING ACROSS THE CURRICULUM

In the call for a radical restructuring of the curriculum to foster thinking and writing abilities, the first step is to recognize that these activities should occur in every classroom across the curriculum. Over the past ten years, there has been an unprecedented increase of writing across the curriculum programs, not only at small liberal arts colleges but also at large technological universities. The call for improved literacy is popular. Stronger still, however, is the argument that writing is a means of learning, the main theme of the rationale in this report for "writing across the curriculum" in our colleges and institutes.

Prior to the 1960s, the dominant concept of academic writing tended to concentrate writing instruction in English departments. Primary emphasis was given to the written product, and to formal elegance and grammatical correctness. Writing assignments in all courses were primarily a test of students' knowledge and writing skills. Instructors in subject areas other than English naturally felt reluctant to teach writing thus defined.

Findings from composition research have resulted in attention shifting from the product of writing to the process itself: to the individual writer's process and to the social or communal process of making meaning. This research, based on the study of writers' actual behaviours, suggests that we learn to write best by dealing with material we care about and by having a clear guiding purpose. The findings suggest that writing is a continuous, untidy process of discovery, and that the process often loops back on itself as new ideas modify earlier plans. Viewed this way, writing is closely analogous to

thinking and learning. This new perspective encourages the belief that writing can be more than a test of knowledge and skill, and that all instructors can teach writing in their fields to enhance student learning.

James Britton, whose work has helped to shape the "writing across the curriculum" movement, classifies language into three types:

- expressive
- transactional
- poetic

According to Britton, expressive language is the matrix from which the other two develop. It is the language of casual speech, personal letters, and diaries. It is also the language of exploratory writing, in which the writer does not worry about an audience and is free to catch thought on the wing. Transactional writing is writing to communicate, a means of getting something done. Poetic writing is not meant to get something done but to make something through the medium of words.

The American scholar Linda Flower has developed parallel concepts of "writer-based" and "reader-based" prose. Her ideas, along with those of scholars such as Janet Emig, suggest that raw, untransformed expressive writing can be a means of learning.

Exponents of "writing across the curriculum" support teaching techniques which encourage students to shape their writing progressively and not rush to a final product. Such writing includes journals or learning logs which encourage the writer to be exploratory and to clarify thinking. Instructors, responding as subject specialists, may also design writing assignments to elicit specific thinking patterns. Students may be led through a sequence of assignments which build upwards from simple to complex thinking.

All writers need a sense of purpose, and this may be best achieved by putting content at the core of the writing process. A sense of purpose may be fostered, too, if written assignments are not always addressed to the teacher as examiner, and if grading criteria reflect the purpose of the assignment rather than conformity with a set of rules. For the student, then, writing across the curriculum offers a means of articulating and exploring subject matter. Writing becomes a serious enterprise, with a purpose that transcends the earning of a grade. In teaching writing from this perspective, instructors can offer students specific strategies to use as they shape their material. Many of these are thinking strategies appropriately taught in the subject area classroom where the instructor can demonstrate the thinking strategies important in the discipline before asking students to apply them in their writing.

The premise that writing is a social act has also helped shape the Writing Across the Curriculum movement. Students who are poor in the vocabulary of abstract thought or specialized knowledge will be permanent exiles from academe and the professions. Learning to write in any field may be seen not only as the acquisition of a set of rules, but as the initiation into a culture. The highly developed and meaningful language of the culture, then, is best taught by a "native speaker", a trained specialist who belongs to the community. Taught in this way, specialized writing will be a natural extension of the work and talk that go on in the classroom and will be demystified for students.

One powerful technique to help build learning communities in the classroom is that of collaboration. This offers a social context in which students may converse in the language of the subject. Collaborative learning takes many forms in Writing Across the Curriculum programs: instructors collaborating with students, students with one another, and writing centre staff members serving as responsive audiences but not evaluators.

How Writing Promotes Learning

Anecdotal reports from many students and teachers suggest that writing across the curriculum has been highly effective in improving student learning, writing, and overall morale. However, few studies have investigated the effects of writing on learning. The studies which have been done indicate that the relationship of writing to learning is complex, and varies with the writing task. In 1987, Judith A. Langer and Arthur N. Applebee published the results of their three year study of the use of writing assignments in two San Francisco high schools. Broadly, they conclude that students who write about course material retain more than students who do not. The more students have to manipulate ideas as they work them into the structure of their own writing, the more likely they are to remember the ideas. Accordingly, material used in an analytic essay is retained best, followed by material used in summary writing and material used in answers to comprehension questions.

In a small scale study, Langer and Applebee provided some insight into the relationship between the writing task and thinking patterns. Students answering study questions engaged in the least complex thinking, limiting attention to restatement of the question and location of the information that answered the question. Students taking notes paid attention to the content of the entire passage, but spent little time considering the relationships among

ideas or integrating the information into larger units. Students writing an essay engaged in the most complex thinking, paying more attention to the global sense of the passage, and forming and validating hypotheses about it.

Langer and Applebee's two subsequent, larger scale studies serve to balance this picture, and indicate that different kinds of writing fulfil different instructional purposes. Results indicated that students who took notes retained a broader range of material than those who wrote essays. However, students writing essays demonstrated greater conceptual grasp of a narrower range of material and longer retention of knowledge about the topic.

These studies indicate, then, that activities which ask students to work with an entire text (note taking and summarizing) may best help students to review a large body of information. Conversely, activities which focus attention on specific material within a text may lead to a better understanding of concepts and relationships.

A study of the writing across the curriculum program at Michigan Technological University (Young and Fulwiler) has also yielded encouraging findings about writing and learning. After examining the use of journal writing in mathematics, researchers tentatively concluded that students who "translate" math concepts into language may learn by thinking about those concepts in non-traditional ways. Although statistical studies failed to prove the usefulness of journals conclusively, analysis of the journals themselves for evidence of thinking skills showed that students had used them to compose practical definitions of mathematical terms in their own words; evaluate the usefulness of course material in terms of their own experience; devise strategies for approaching problems in analytic geometry and calculus; and discover solutions to problems. The last function is interesting, since the thinking that sparked discovery apparently occurred during writing, suggesting that the journals had a learning value beyond the simple consolidation of knowledge.

Two further studies at MTU provide some evidence that writing across the curriculum improves student writing. Students in a section of a civil engineering course used journals regularly to comment on course material and learn work in progress. In comparison with a control section, the students who kept journals "produced final reports on design projects that were generally more coherent, organized, and complete than were the reports of the students in the control section." A second controlled study examined lab reports written by biology students who had been shown models of writing in the discipline and used peer critiques as they developed their drafts. These students' finished reports were superior in both organization and content to those of students in a control section.

The Instructor's Response to Writing

If writing is seen as a means of learning, the instructor's response should be an aid to learning. Response, then, should be separated from evaluation, which is a measure of learning. Instructors may usefully react to their students' writing as mentors, guides, or interested readers, roles which may be played by the subject specialist as readily as by the writing instructor.

This view of the instructor's response has two corollaries. First, not all written assignments should be graded. While grading encourages careful, full development of ideas, it may well discourage the spirit of discovery in writing. The second corollary concerns the timing of the response. In order to foster good writing as well as effective learning, response to major writing assignments should begin early during the writing process. Early response (verbal or written comments on drafts or plans) is perceived by successful teachers as more helpful than response to the final draft (Freedman 157).

Although research on the response to writing in fields other than English remains to be done, one may tentatively conclude that the most helpful responses are those which the subject specialist is best qualified to give. As far as stylistic matters are concerned, the goals of good writing are probably not served by meticulous marking of every error in an error strewn paper (Hairston 5). Correcting one or two pages and having the student edit the rest for himself may well be more effective, together with comments that summarize the main strengths and weaknesses of the paper.

Evaluation itself needs further investigation. Criteria of good writing need to be developed for every field, rather than imposed from a prescriptive model of good English (Young and Fulwiler 128). Such criteria will be based partly on the conventions of discourse that govern writing in the field, and partly on the rules of evidence that govern effective argument in that discipline. Agreement needs to be reached (and conveyed to students) about the kind of writing error which seriously distorts meaning and the kind which merely blemishes it.

In the long term, the student's values about writing will be shaped by an instructor's response to his writing, whether or not those values are explicitly linked to a grading system. The instructor's concerns about style, organization, grammar or content will determine the student's attitudes.

The Implementation of Writing Across the Curriculum

Successful programs of writing across the curriculum require, initially, knowledge and interest on the part of the faculty. Their continued operation require carefully designed support which answers the needs of both faculty and students. Finally, the pattern of organization must be appropriate to the needs of the institution.

Most programs are initiated by faculty workshops, offered by writing specialists. Their content includes information about the writing process and the use of writing in courses on any subject. Participants explore ways to design good assignments, to give appropriate directions to students, to evaluate writing, and especially to use writing to help students learn. Faculty workshops have been found not only successful in raising faculty consciousness about writing, but also in promoting collegiality by providing a focussed time for intellectual and social interaction across disciplinary lines (Fulwiler 122).

Once faculty have decided to include more writing in their courses, they need an assurance of continuing support. This may either aid them indirectly, by helping their students, or directly, by helping them design and use written assignments.

One of the best established forms of support for writing across the curriculum is the writing centre or essay tutoring centre. Writing centres offer individual help to students working on writing assignments, usually on a drop-in basis. Writing centres may also offer periodic workshops for students, on such topics as writing essay examinations.

In addition, writing centres may operate as a consulting service to faculty. They may advise on the design of assignments and handouts, the development of evaluation criteria, and the assessment of an assignment's effectiveness. Help may be given individually or through periodic workshops on specific teaching problems or strategies. Writing centres for faculty may also house resource material for the teaching of writing.

Another way to increase the amount of student writing while mitigating its effect on instructors' workload is through peer tutoring. Senior students with a good writing record are trained to work collaboratively with other students, either in class or in a writing centre. Alternatively, peer tutors edit first drafts of papers; the instructor then deals with content alone. In some cases, peer tutors (who may be called Writing Fellows) are appointed to work directly with the classes of instructors who do not wish to teach writing. Tutors must, of course, be adequately trained and paid. Some colleges offer

a special section of English Composition as a peer tutoring course. Students who score well on a placement test are invited to enrol, and those who complete the course satisfactorily become paid tutors.

Programs for writing across the curriculum may be implemented in a variety of ways. In the most global, or least formal pattern, instructors in all disciplines are encouraged to have their students write regularly. A college-wide policy about the importance of writing may be formulated and published in the college calendar.

A second pattern is based on designated Writing-Intensive courses (often labelled "W" courses) with extra written components. The student instructor ratio may be reduced for these courses, allowing the instructor added time for reading papers and conferring with students. For those who believe writing is essential to all learning, this pattern has a major weakness: the designation of only some courses as "writing-intensive" signals to students that writing is important in some courses but does not matter in others.

A third organizational pattern is the pairing of a composition course with a subject course (one in psychology, for example). Students enrol in both courses and the instructors team-teach, collaborating on assignments. A variant on this pattern is the "course cluster" in which three or four faculty members work together in an interdisciplinary course grouping.

Existing Writing across the Curriculum Programs

In "Writing across the Curriculum at Community Colleges," Stout and Magnotto discuss the results of a survey sent to U.S. and Canadian colleges on the mailing list of the Americal Association of Community and Junior Colleges. The survey was designed to investigate the present state of writing across the curriculum in community colleges. Preliminary findings show a wide range of longevity, funding, and organization. A few programs started before 1979; many began in the 80s, and some colleges are just beginning to consider implementing programs.

Most organizational patterns are college based, but two are system-wide, one in Minnesota and the other in Maricopa, Arizona. They are typically directed by a faculty member, although a few are managed by administrators. Release time for faculty writing across the curriculum directors ranges from less than one course equivalent to full time reassignment. Multidiscipline writing across the curriculum committees are common.

One of the most solidly established writing across the curriculum programs in North America is at Michigan Technological University. This program is of particular interest, since it was studied over several years by a team of

researchers who evaluated its impact on the life of the university (Young and Fulwiler 1). While the experience of one institution cannot necessarily be generalized to others, the MTU study, published in 1986, is a useful source of information about the translation of theory into practice.

Several surveys of faculty attitudes towards writing, carried out immediately before and after faculty workshops over a four-year period, concluded that the workshops had at least created short-term changes in attitude, and greater awareness of the usefulness of writing (Young and Fulwiler 65). A subsequent study demonstrated that a large number of faculty had made changes and felt that their teaching of writing had improved (Young and Fulwiler 82).

Another strong writing across the curriculum program in the United States is Writing and Reading in the Technologies (WRIT) at Queensborough Community College in New York. This began in 1982 in vocational and technical programs, but has now spread to the liberal arts section of the college. WRIT emphasizes writing to learn through journals and microthemes (miniature essays with thesis and key supporting points).

Writing across the curriculum programs are well supported by post-secondary institutions in Washington State and appear to be closely linked with the interdisciplinary teaching which is growing throughout the state. The University of Puget Sound offers writing intensive courses, and its Writing Centre supports writing in all disciplines, providing individual tutorial help as well as in-class or special subject workshops. Writing Centre faculty also serve as consultants to colleagues in all departments, many of whom meet at writing colloquia. Western Washington University supports a successful Writing Fellows program as well as the University Writing Services. Washington State University and Evergreen College have both developed interdisciplinary and critical thinking programs.

In Canada, a unique across the curriculum program closely allied in philosophy to the tenets of James Britton has been developed at Dawson College in Montreal. Named Literacy Across the Curriculum (LAC), it aims to help teachers improve students' thinking ability and communication competence by placing greater emphasis on language in the classroom. As the first funded LAC program in Quebec and one of the few in Canada, it has grown since 1984 into a centre of faculty development for the English secondary and post-secondary system in the province, and a liaison centre with the French sector. The program is not focussed exclusively on writing, but is built on the premise that all language modes are interconnected and tied to learning.

Another Canadian writing across the curriculum program is at York University's Atkinson College. Named the Atkinson College Writing Programs, it aims to improve the quality of student writing in all disciplines by providing writing instruction and assistance in various formats. Writing Programs integrates several components: interdisciplinary courses, an essay tutoring centre, and consultation to faculty.

The University of Winnipeg Writing Program developed from a curriculum review process in which some faculty members contended that fully developed cognitive, analytic, and expressive skills do not always evolve from education in the established curriculum. Convinced that expressive competence and self-confidence are central to active participation in the intellectual life of the university and of society, faculty aimed for a writing program which would develop these attributes. The Writing Program, housed in the English Department, has two major components: first year writing courses and writing-intensive courses offered by every discipline in the university (Besner 6-10).

Here in British Columbia, some writing support programs are already in place. Six colleges have peer tutoring programs and nine have developed writing centres. However, if they are to offer advice to faculty on such specialized matters as sequencing assignments to meet cognitive goals, the mandates and resources of existing writing centres will have to be considerably expanded.

Fraser Valley College, with help from a Locally Initiated Curriculum Development Grant, is developing a writing across the curriculum program coordinated by the Communications and English Departments and involving a core group of interested faculty. Its goal is to create a structure which reinforces what is learned in writing courses with developmentally structured writing in all disciplines. In addition, it aims to enhance students' critical thinking abilities and understanding of course material.

Summary

Successful writing across the curriculum programs appear to be based both on faculty enthusiasm and administrative support. As Langer and Applebee write, "Institutional change does not take place when it is in conflict with institutional values" (147). Administrative support must take the tangible form of release time and guarantees of reasonable class size; large classes work against the concept of writing to learn. Ultimately, the value of writing across the curriculum must be recognized by provincial articulation

committees and built into the criteria by which courses are articulated for transfer and credit. Publicly stated institutional policies about the amount of writing normally expected in courses would be a useful starting point.

Successful programs of writing across the curriculum appear to benefit students by helping them learn more effectively and improve their writing ability at the same time. Also, they often benefit institutions by bridging gaps between departments and disciplines. By exploring the academic uses of language in interdisciplinary seminars, faculty members may strengthen their sense of their own discipline while perceiving the relationships between disciplines. At the same time, discussion of methods may lead to the discovery of shared concerns. Among instructors as well as students, then, writing across the curriculum can foster community and collaboration.

CONCLUSIONS

As post-secondary educators meet the challenge to prepare their graduates for successful participation in an information age society, they are faced with increasing needs for professional development. Subject specialists need opportunities to remain current in their own discipline. In addition, they are not only required to cope with increasingly varied student needs, but must also respond to expectations of employers for graduates to be able to read more efficiently, communicate more clearly, and reason more effectively. Few subject teachers have the necessary training to teach students how to do this.

The quiet revolution taking place in post-secondary classrooms across the continent confirms that, given appropriate training, teachers in all subject areas can make a difference in student learning. By ensuring students are actively engaged in the reading, reasoning, and writing processes of their subject, teachers across the disciplines are contributing to improved student learning.

Changing Teaching Approaches

Anecdotal reports from faculty participating in successful programs testify that when they use active learning approaches, students are more motivated and they themselves feel revitalized. In incorporating student-centred interactive language and thinking approaches in their instruction, however, many instructors will, of necessity, change their view of their own role and the role of learners. For institutions looking to effect positive pedagogical

change, a supportive environment will be critical. Instructors must feel safe in giving up old methods and risking the uncertainty of learning something new.

Change is a multistage cycle and all stages must be negotiated somehow or other before a new stability can be reached (Schein 245-247). In the first stage, instructors may discover that many of their assumptions about how students learn are not valid or that their present teaching is not leading to expected outcomes. In the second stage, as they try out new approaches, support from peers and administrators is essential. It is also important for teachers to have a rationale or theory that underlies and supports their teaching practices to adequately explain both their successes and failures. Without the third stage, the integration of new behaviour, no real change actually occurs. In this stage of consolidation, team endeavours are more powerful than individual ones as group members support each other in implementing new strategies.

In successful change, a crucial role is played by the "change agent," someone who can link needs with available resources. One function of a change agent is to demonstrate new approaches and to provide continuing support for instructors trying out new practices. Cooperation with this person (or group) occurs when the target group is voluntary, can leave at any time, trusts the change agent, and faces no enforcement of change. Resistance generally occurs when change agents emphasize an official role, when a group is captive, feels threatened or helpless, or when change is mandated (Gere and Smith 29).

As part of the stage of consolidation, teachers need to make a clear connection between how they teach and what students learn. They need to evaluate the effectiveness of their instruction by collecting feedback on what and how well their students are learning. In this process, the classroom becomes both a teaching and a research environment, a place where pedagogical questions themselves become agents of change (Goswami and Stillman). In pressing for classroom-based research, Patrica Cross proposes that "thousands of small changes made in classrooms . . . may well add up to more real reform of education than sweeping policies made far from the scene of the teaching/learning action" (Phi Delta Kappan 499).

Future Directions for Teaching Across the Curriculum in British Columbia

As individuals, departments, and entire institutions in the British Columbia college and institute system explore ways to improve student learning, lessons can be learned from the collective experience of colleagues and organizations elsewhere. A comprehensive approach appears to be the key

to effective instructional change: curriculum planning, course design, faculty development, integration of research, articulation with other levels of the educational system, and program assessment.

As stated earlier, one area that has scant experience for us to draw upon is that of subject-based reading instruction at the post-secondary level. If our colleges and institutes are to prepare students for the changing future in which independence in text learning will be increasingly important, instructional development programs will need to include components of content-based reading instruction. British Columbia can play a leadership role in providing such programs.

For those initiating instructional development programs to help teaching faculty incorporate reading, writing, and critical thinking instruction in their courses, the Bay Area Writing Project model offers a useful set of principles and practices (Gray 35-45). Its success can be attributed to its egalitarianism and its emphasis on direct teaching experience in which successful teachers show each other what they do and how they came to do it.

In the preceding sections, reading, critical thinking, and writing instruction have been treated separately, but only because the volume of information, issues, and pedagogical approaches inherent within each demanded such treatment. The reader will realize, however, that, for graduates to be literate, thinking, responsible citizens, good teaching must address these areas simultaneously in any classroom instruction. For British Columbia's colleges and institutes, forging links across disciplines will also be crucial in preparing graduates for changing times ahead in an increasingly global community. In other parts of North America, successful writing and critical thinking faculty development programs have shown to be instrumental in forging such links.

In Washington State, interdisciplinary ventures have gained national recognition. Fostered by the Washington Center for Improving the Quality of Undergraduate Education, the number of interdisciplinary "learning community" programs are increasing throughout the state and are viewed as having "compelling and exciting answers, all at once, to many of the challenges which confront undergraduate education today" (MacGregor).

The following recommendations are based on examination of experiences elsewhere in improving teaching and learning and are intended to complement discipline-based professional development designed to help faculty remain current in their field. There is a need for a comprehensive "grassroots" approach in which the autonomy of instructors and diversity of educational tasks are respected and expertise that is already present is recognized and tapped. At the same time, a system-wide approach is necessary for resources and information to be shared. Discussion across

disciplines is needed for commonalities to be shared; **communication across institutions** is needed to help discipline areas develop subject-based instruction of reading, critical thinking, and writing. Both are necessary and both require resources.

RECOMMENDATIONS FOR BRITISH COLUMBIA'S COLLEGES AND INSTITUTES

RECOMMENDATION I: FIVE-YEAR COMMITMENT

It is recommended that individual institutions and the Ministry of Advanced Education and Job Training (hereafter referred to as the Ministry) make a five-year commitment to provide resources for instructional development for subject-based teaching of reading, critical thinking, and writing.

RECOMMENDATION II: INSTITUTIONAL SUPPORT

It is recommended that each institution support instructional development programs in teaching writing, critical thinking, and reading across the disciplines. Such programs should include:

- Building awareness of the need for instructors in all areas to teach writing, critical thinking and reading.
- Identifying and supporting a core group of instructors who will receive training and who will serve as catalysts for instructional development within their institution and possibly across the system.
- Recognition of the time that faculty need for attending seminars and for course preparation when incorporating new instructional approaches to include reading, thinking, and/or writing activities.

RECOMMENDATION III: MINISTRY FUNDING

It is recommended that the Ministry provide direct funding for institutional projects and for the development of a coordinated approach for instructional development for improving teaching of reading, critical thinking, and writing skills across the curriculum. This funding should provide for a five-year project under the leadership of a project team and could be administered by the Development Centre. Specific activities of this project would be:

- funding institutional-based projects to implement across-the-curriculum activities.
- arranging annual regional faculty development workshops in order to
 - train core groups of instructors at each participating institution who will act as catalysts to introduce subject-based teaching of reading, critical thinking, and writing.
 - ensure “cross-fertilization” of successful approaches.
 - provide opportunities for discipline-based workshops as increasing numbers of instructors incorporate new instructional approaches.
- arranging for one major conference each year for the duration of the project on the topic of reading, critical thinking, and writing across the curriculum.
- publishing at least four newsletters per year as well as creating and managing an ongoing electronic conference.

RECOMMENDATION IV: CURRICULAR CHANGE

It is recommended that educational planning and policy both at the institutional and system level continue to emphasize the development of curricular change to incorporate the teaching of reading, critical thinking, and writing skills.

RECOMMENDATION V: MODES OF INSTRUCTION

It is recommended that institutions examine, implement, and evaluate innovative modes of instruction which enhance learning, such as

- Collaborative learning
- Peer tutoring

- Individualization as provided by faculty-supported writing and critical thinking centres.
- Interdisciplinary teaching

RECOMMENDATION VI: SECONDARY SCHOOL AND UNIVERSITY LIAISON

It is recommended that colleges and institutes play a leadership role in building cooperation between secondary and other post-secondary levels concerning comprehensive reading, critical thinking, and writing approaches.

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MEETING NEW CHALLENGES ACROSS THE CURRICULUM

**A REPORT ON TEACHING
READING, CRITICAL THINKING
AND WRITING IN ALL
SUBJECT AREAS**

prepared by

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November 28, 1988

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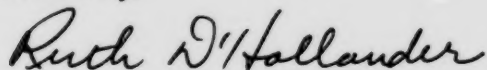
Dear Mr. Wright:

On behalf of the Instructional Development Advisory Committee, I am pleased to forward to you a report on teaching reading, critical thinking, and writing in all subject areas. The report is entitled Meeting New Challenges Across the Curriculum. The members of my committee and the Instructional Development Advisory Committee very much appreciated the support of the Council of Principals and the funding provided by the Ministry of Advanced Education and Job Training which permitted this project to proceed.

Meeting New Challenges Across the Curriculum is the result of an extensive review of the available literature and related practices across North America. The status of "across the curriculum" activities in British Columbia was determined through the use of a survey. The response from the field was very positive. This suggests that, with the continued support of the Council and Ministry, projects will be initiated to address the reading, writing and thinking skills of our graduates.

The report recommends that a multi-layered commitment be made to support a variety of projects in support of reading, critical thinking, and writing in all subject areas in our colleges and institutes. It suggests many alternatives which can be considered by individual institutions in addition to provincial initiatives. It is expected that Meeting New Challenges Across the Curriculum will serve as a needed catalyst.

Yours truly,



Ruth D'Hollander

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MEETING NEW CHALLENGES ACROSS THE CURRICULUM

EXECUTIVE SUMMARY

Introduction

Post-secondary graduates face evolving demands in a pluralistic society and can expect to experience several career changes in their lifetime. In this information age, their ability to adapt, learn, and communicate is becoming as important as what they learn, if not more important. Traditional instruction has focussed on the teaching of specific discipline content, often without attention to the learning process itself. Few post-secondary educators, however, have training in teaching students how to learn, reason effectively, read efficiently, and communicate clearly. To complicate matters further, colleges and institutes are now expected to accept students with a broader range of abilities, experience, and needs than in the past. This report examines what might be done to help teachers be better teachers and students better learners.

Across the continent, since the early 1970s, a quiet revolution has been taking place in post-secondary institutions as new knowledge about the nature of learning has spread to teachers in all disciplines. Increasing numbers of teachers are promoting student-centred active learning, viewing learning as a **multi-faceted, complex interaction, with language playing a crucial role as the principal instrument of interaction.**

Many teachers are now playing more the role of coach than lecturer. Acknowledging that students become expert in subjects by using the language of the subject, by talking, thinking, reading, and writing about it, they are balancing instruction in both process (how to read, write, and think) and content (curriculum). They are placing a growing emphasis on helping students learn how to learn and on teaching higher-order cognitive skills.

Reading, Critical Thinking, and Writing Across the Curriculum

In the quiet revolution to improve student learning, a first step has been to recognize that critical thinking and writing should occur across the curriculum in every classroom not only in the liberal arts but also in the vocations and technologies.

While effective reading is deemed essential by all concerned, post-secondary instructors have yet to learn how to teach students to be more effective in using the college text as an aid to learning.

Cognitive science research, as well as a number of programs currently in operation, strongly suggest that the same critical thinking processes are involved in reasoning in all sorts of educational contexts, from the strictly academic to the vocational. Teaching a self-conscious approach to thinking skills across the curriculum contributes to sound and transferable learning while promoting more in-depth analysis of problems and exploration of solutions.

Exponents of writing across the curriculum support teaching techniques which encourage students to shape their writing progressively and not rush to a final product. Such writing includes activities in which the writer explores and clarifies thinking. This raw, untransformed expressive writing is seen as an important means of learning. Assignments elicit specific thinking strategies and patterns leading students from simple to complex thinking. By putting content at the core of the writing process, subject teachers are providing students a needed sense of purpose. For the student, writing across the curriculum offers a means of articulating and exploring subject matter. Writing becomes a thoughtful enterprise, with a purpose that transcends the earning of a grade.

In any discipline, reading, thinking, and writing serve not only in the acquisition of knowledge but as social acts towards integration into a culture, whether scholarly or technical. The highly developed and meaningful language of the culture is best taught by a "native speaker," a trained specialist who belongs to the community. One powerful technique to help build a learning community in the classroom is that of collaboration.

Programs Across the Curriculum

Reading and Learning from Text

A review of the current literature shows a paucity of programs at the post-secondary level designed to improve reading in the content areas. Recent secondary school program models have shown, however, that once subject specialists are given opportunities for learning how to integrate reading instruction with content instruction, they become very successful in teaching students how to learn from text. It is expected that post-secondary instructors can do likewise.

Critical Thinking

While there is considerable interest in and perceived need for the introduction of critical thinking instruction across the curriculum at the post-secondary level, the description of actual programs in British Columbia is rather short. There have been some informal attempts, mostly on the initiative of individual instructors and mainly in adult basic education. The British Columbia Association for Critical Thinking Instruction and Research is examining the area of critical thinking across the curriculum. No formal critical thinking across the curriculum program has, as yet, emerged.

There are three existing program models in North America which can serve as a resource for developing critical thinking across the curriculum in British Columbia:

- the Tandem Course Model, pairing free-standing critical thinking courses with specific-content courses.
- the Faculty Development Model, introducing critical thinking instruction through professional development for faculty.
- the Integrated Course Model, combining critical thinking courses and critical thinking approaches within content courses. This model is the one recommended in this report.

Writing

Returns of Reading and Writing Across the Curriculum Questionnaires sent in March 1988 to all colleges and institutes in British Columbia show many levels of awareness about writing across the curriculum within the province and a definite concern for improving student writing in all subject areas. The only program that has been established is at Fraser Valley College.

The findings from a recent survey of writing across the curriculum programs in community colleges in the U.S.A. and Canada indicate a wide variety of funding levels and organizational patterns. This survey also shows that most programs are college-based and are typically directed by a faculty member. Multi-discipline writing across the curriculum committees are common.

Some of the most solidly established writing across the curriculum programs in North America began in technological and vocational settings.

In order to build knowledge and interest among faculty, writing across the curriculum programs are usually initiated by interdisciplinary faculty workshops. Classroom application of the concepts and approaches introduced in these workshops is supported by consultation services. In addition, students working on written assignments may be helped by writing centres and/or peer tutoring. The programs themselves may take a variety of forms, including paired (linked, coordinated) courses and writing intensive courses.

Future Directions for Teaching Across the Curriculum in British Columbia

As individuals, departments, and entire institutions in the college and institute system explore ways to improve student learning, lessons can be learned from the collective experience of colleagues and organizations elsewhere.

A comprehensive approach appears to be the key to effective instructional change: careful planning, curriculum and faculty development, integration of research, articulation with other levels of the educational system, and program assessment.

Guided cooperative sharing in which teachers teach teachers from all levels and across the disciplines has been demonstrated by The Bay Area Writing Project (University of California, Berkeley) to be a proven faculty development model. Although it has been applied across the United States and internationally to improve the teaching of writing, it may be concluded that its basic principles apply also to improving the teaching of critical thinking and reading.

Institutions and departments looking to effect positive pedagogical change need to provide a supportive environment throughout the change cycle. Positive change occurs when groups are voluntary, trust the change agent(s), and face no enforcement of change. Resistance generally occurs when groups feel captive, threatened or helpless, when change agents emphasize an official role, or when change is mandated.

An important step in effecting instructional change occurs when teachers make a clear connection between how they teach and what students learn. In this process, the classroom becomes both a teaching and a research environment, a place where pedagogical questions themselves become agents of change.

Sharing common goals and concerns, university, college, and school teachers in all subject areas play a crucial role in improving student learning. Both teachers and students benefit from the experience and information provided when teachers at all educational levels meet to discuss effective teaching and learning.

Forging links across disciplines is crucial in preparing graduates for changing times ahead. Successful writing and critical thinking faculty development programs and interdisciplinary programs such as those fostered by the Washington Center for Improving the Quality of Undergraduate Education have shown to be instrumental in forging such links.

The following recommendations are based on examination of experiences elsewhere in improving teaching and learning and are designed to complement discipline-based professional development designed to help faculty remain current in their field. There is need for a comprehensive "grassroots" approach in which the autonomy of instructors and diversity of educational tasks are respected and expertise that is already present is recognized and tapped. At the same time, a system-wide approach is necessary for resources and information to be shared. Discussion **across disciplines** is needed for commonalities to be shared; communication **across institutions** is needed to help discipline areas develop subject-based instruction of reading, critical thinking, and writing. Both are necessary and both require resources.

Recommendations for British Columbia's Colleges and Institutes

I: Five-Year Commitment

It is recommended that individual institutions and the Ministry of Advanced Education and Job Training (hereafter referred to as the Ministry) make a five-year commitment to provide resources for instructional development for subject-based teaching of reading, critical thinking, and writing.

II: Institutional Support

It is recommended that each institution support instructional development programs in teaching writing, critical thinking, and reading across the disciplines. Such support should include:

- *Building awareness of the need for instructors in all areas to teach writing, critical thinking and reading.*
- *Identifying and supporting a core group of instructors who will receive training and who will serve as catalysts for instructional development within their institution and possibly across the system.*

- Recognition of the time that faculty need for attending seminars and for course preparation when incorporating new instructional approaches to include reading, thinking, and/or writing activities.

III: Ministry Funding

It is recommended that the Ministry provide direct funding for institutional projects and for the development of a coordinated approach for instructional development for improving teaching of reading, critical thinking, and writing skills across the curriculum. This funding should provide for a five-year project under the leadership of a project team and could be administered by the Development Centre. Specific activities of this project would be:

- funding institutional-based projects to implement across-the-curriculum activities.
- arranging annual regional faculty development workshops in order to
 - train core groups of instructors at each participating institution who will act as catalysts to introduce subject-based teaching of reading, critical thinking, and writing.
 - ensure "cross-fertilization" of successful approaches.
 - provide opportunities for discipline-based workshops as increasing numbers of instructors incorporate new instructional approaches.
- arranging for one major conference each year for the duration of the project on the topic of reading, critical thinking, and writing across the curriculum.
- publishing at least four newsletters per year as well as the creation and management of an ongoing electronic conference.

IV: Curricular Change

It is recommended that educational planning and policy both at the institutional and system level continue to emphasize the development of curricular change to incorporate the teaching of reading, critical thinking, and writing skills.

V: Modes of Instruction

It is recommended that institutions examine, implement, and evaluate innovative modes of instruction which enhance learning, such as

- Collaborative learning
- Peer tutoring
- Individualization as provided by faculty-supported writing and critical thinking centres.

- Interdisciplinary teaching

**VI: Secondary School
and University
Liaison**

It is recommended that colleges and institutes play a leadership role in building cooperation between secondary and other post-secondary levels concerning comprehensive reading, critical thinking, and writing approaches.

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Ruth D'Hollander

BACKGROUND OF THE PROJECT

In Fall 1986, the Council of Principals identified the development of human resources as a priority, and in January 1987, established the Instructional Development Advisory Committee (IDAC) to complement the work of the Management Development Advisory Committee. IDAC was asked to examine issues related to instructional development in the British Columbia colleges and institutes.

Among the many areas IDAC identified as warranting attention was the challenge educators face in preparing their graduates for successful living and employment in an information age society. In light of the wide array of learning problems that students present when they come into our colleges and institutes, helping them become better writers, thinkers, and readers appears to many teachers as an overwhelming challenge. To this end, instructors in a variety of subject areas are working to help students become better readers, writers, and thinkers. IDAC decided to look more closely at this trend and to investigate the advisability of endorsing and supporting such an approach. The Council of Principals, on behalf of IDAC, requested and received Ministry funding in January 1988 for this investigation into meeting the challenge of teaching writing, critical thinking, and reading across the curriculum.

The mandate given to this project was to

(a) summarize current research and literature about the relationship between student achievement and subject-based teaching of writing, thinking, and reading skills;

- (b) describe the present status of writing and critical thinking across the curriculum in our colleges and institutes;
- (c) describe a selection of successful program models outside the province; and
- (d) describe alternatives for instructional development opportunities in individual institutions as well as across our college and institute system.

The process of preparing this report has consisted of a review of current literature based on ERIC searches and suggested readings from professionals in the field; direct contacts with teachers and directors of programs via phone, mail, and arranged meetings and attendance at a few selected conferences. Questionnaires (Appendices C and D) were mailed in March 1988 to Deans of program areas at the colleges and institutes in British Columbia to gain a sense of the status of reading, writing, and critical thinking across the curriculum in the province. Fifteen institutions responded with a total of thirty-eight responses. An additional critical thinking questionnaire (Appendix E) was sent to students in critical thinking courses in selected British Columbia colleges and universities.

The findings contained in this report are by no means exhaustive. Specific instances of successful programs are illustrative only and are not intended to represent all those in place or even all those made available to the researchers.

Many excellent teachers are effective catalysts for student learning. They are committed to increasing students' desire and ability to learn, to be effective readers, communicators, and problem-solvers. Their long-term aim is to help students become lifelong learners, successful wage-earners, and responsible citizens. The goal of this project is to begin or, as the case may be, to continue the conversation throughout the British Columbia college/institute system about learning theory and teaching practices which have been successful in making subject specialists better teachers and students better learners. If the recommendations at the conclusion of this report are acted upon, it is expected that these exceptional teachers will have the opportunity to share their successes with interested colleagues and thereby enhance student learning on a wider scale throughout our province.

INTRODUCTION

The Challenges

How to improve students' reading, critical thinking, and writing skills to enable them to participate fully in our pluralistic society and democratic system of government is only one of the broad challenges facing our educational system today. Rapidly evolving needs of the workplace are also presenting challenges to our information age post-secondary institutions. The Occupational Outlook for British Columbia and the Yukon as described by Employment and Immigration Canada stresses increasing needs for analytical and communication skills on the part of all workers (Farris 5, 16). In a recent report to the United States Department of Labour, the Hudson Institute states that "between now and the year 2000, for the first time in history, a majority of all new jobs will require post-secondary education" (Johnston xxvii). The Hudson Institute report indicates a direct correlation between level of skills required and the rate of growth of employment in an occupation (98). Furthermore, it says "technology will introduce change and turbulence into every industry and every job. In particular, the necessity for constant learning and constant adaptation by workers will be a certain outgrowth of technological innovation" (37).

Colleges and institutes, along with secondary schools, are on the front line, required to meet the challenge for improving the reasoning and communication skills of students. In these times of economic instability, two-year post-secondary programs are becoming increasingly significant. Students, less able to commit themselves to long educational programs, look to the colleges and institutes to meet their educational needs. Moreover, the

open-access policy heightens the challenge for post-secondary educators as they now cope with larger numbers of students who lack adequate language and study skills. Increasingly, more mature students are returning to school and learning disabled students are seeking post-secondary educational opportunities. Many of these require academic and personal support to achieve success at college and present a wide range of instructional problems for faculty. This growing challenge now requires all teachers and departments to share responsibility for helping all types of students to learn more effectively in their courses. Many instructors lack the specialized skills to face these challenges effectively. Few have been trained to teach writing (Gray 35), and almost none to teach reading and thinking. Many instructors, especially those recruited from industry and business, have neither training nor prior experience in teaching. Yet it is becoming increasingly evident that subject teachers need to teach reading, writing, critical thinking, and study skills specific to their courses and to help students in difficulty. Thus teachers in all disciplines are looking for assistance in facing these challenges.

Traditional Responses

Some teachers seek ways to help individual students by attending in-service programs or consulting with the learning specialist in their college. Some alter their curriculum and compromise standards. Some continue in old ways, ignoring the demand for change and growth. Assuming students have the required skills, they remain convinced that it is not their job to teach students how to read, write, speak and think more effectively. Many struggle along silently, aware that they have a responsibility to help students improve their literacy skills, but reluctant to admit they lack expertise to do so.

Frequently, departments pass the responsibility for improving student writing, reading skills, and critical thinking to English or Communications Departments, Reading and Study Skills Centres, or Philosophy Departments. While the courses offered in these areas are important and have definite merit for the students who take them, experience has shown that limiting language and critical thinking instruction to them is not enough. There are several reasons for this.

First, the limited availability of such courses, and the difficulty of fitting them into students' timetables, restrict their impact. Second, the skills they teach are not always readily transferred. Even students enrolled in free-standing reading, writing, or critical thinking courses forget to use skills and strategies learned in these classes. This may be because they suffer information overload as they grapple with complex, new knowledge. It may also be

because they have not yet seen the applicability of the process they learn in one course to the content of another. Apparently, skills learned in isolated settings are often not transferred to other subjects and situations.

A third reason is that some skills need to be learned in the context of specific subjects. Exercises, isolated from relevant context, do not ensure learning (Tchudi 22-30; Moffett 7; Smith 390). Just as one does not learn to ride a bike by learning in one instance to hold the handlebar, in another to move the pedals, and in another to steer, one does not become expert in a subject by learning isolated skills and facts without being aware of their relationships. One learns to ride a bike by getting on it and trying, by practising, and by risking a fall or two. Experts in their field have had much practice riding their bikes and they are in the best position to support students' first, shaky efforts. Students need as many opportunities for meaningful, relevant learning experiences as possible. They need to see failures as steps towards learning and to be led through levels of learning in as complete a context as possible.

A fourth reason, less easily characterized but of equal importance, is the message that teachers give, or do not give, about the value and significance of reading, writing, thinking, and speaking well within a subject area. By relegating development of these skills to instruction outside their subject area, subject specialists unwittingly belittle the very activities they value highly. Facing larger student enrollments and fearing an overwhelming marking load, instructors are requiring fewer and fewer written assignments. Students are expected to read the text but are seldom shown how to interact with it. Critical thinking is assumed, often modelled, but seldom taught explicitly. Teachers, in assuming students have the ability to read or write about a topic, are forgetting the complexity of the learning experiences they went through to become the experts they are. By passing the responsibility for improving students' literacy skills to "outsiders," subject teachers are, in effect, signalling to students that content is important, but process is not. They are thus negating the significance of the processes and tools of their own discipline which they value so highly themselves.

The challenge facing educators in all disciplines is to find ways to improve the learning experience both for students and for themselves, while working within the reality of curriculum and workload constraints. In the sections that follow, some successful approaches are reviewed as well as associated rationale and issues. Recommendations are made for future directions in faculty development as instructors prepare to meet the challenge of improving students' reasoning, writing, and reading in all academic fields.

The Quiet Revolution in Teaching

In the book he wrote in 1969, Freedom to Learn, Carl Rogers proposed a way to create a climate in the educational system to facilitate self-directed learning in order to prepare not only students but also teachers to cope with the exponential rate of change in society. He referred to his plan as "a model for revolution" (300). A decade and a half later, C. William Griffin referred to the "quiet revolution" taking place in teaching writing in colleges and universities (1). Whether motivated by the search for excellence in teaching or in response to our changing society, many subject specialists are seeking and finding ways to improve student learning in their courses (Kurfiss 12-14; Griffin 398-403). Many, either dissatisfied with the traditional lecture model or convinced by the findings and arguments of cognitive psychologists and successful colleagues, are abandoning the notion that students are "empty vessels" to be filled with knowledge imparted by the teacher. More and more, teachers are shifting from a uni-directional model of instruction to one which includes more student-centered activity (Chickering and Gamson 3-6). As was pointed out in the 1984 Final Report of the Study Group on the Conditions of Excellence in American Higher Education sponsored by the National Institute of Education, the "effectiveness of any educational policy or practice is through increasing student involvement in learning" (19). Teachers are devising assignments which take into account the variability of students' backgrounds. They are acknowledging that students become expert in subjects by using the language of the subject, by talking, thinking, reading, and writing about it. They are balancing instruction in both process (how to read, write, and think) with content (curriculum). Re-evaluating their classroom practice, they are trying new instructional approaches and are reforming course and teaching practices to help students improve their language and thinking abilities.

The seeds of this "quiet revolution" were sown through the work of Piaget in cognitive development and of Vygotsky in language and thought. They took root in the 1960s as a group of researchers in England (Barnes, Britton, and Rosen) made a seminal study of language and learning in secondary school classrooms. They looked at language interactions in classrooms and examined the relationship between language and thought. Their conclusions about the role of language in learning and the implications of the teacher's use of language (Barnes 75) led to the "Language Across the Curriculum" movement, the forerunner of the "quiet revolution" occurring today.

About the same time, James Moffett at Harvard University wrote Teaching the Universe of Discourse in which he proposed his theory of verbal and cognitive growth and the relationships between language and curriculum.

His work, like that of Carl Rogers, Barnes, Britton and Rosen, contributed to student-centred, process-oriented approaches to instruction across the curriculum.

In California in the 1970s, to address the issue of "Why Johnny Can't Write," a model was developed to train large numbers of teachers to teach writing effectively. Called the Bay Area Writing Project (BAWP), it was a collaborative school-university (Berkeley) effort designed to tap the expertise of outstanding teachers. Teachers attended a five-week invitational summer institute which focussed on three areas: demonstration of their successful classroom practices, study of current theory and research in composition instruction, and practice in writing in a variety of forms. After completion of the summer institute, these trained teacher/consultants met periodically to extend the advances of the summer. They also conducted staff-development workshops with other teachers in their individual institutions or districts.

The basic assumptions of the BAWP model (see Appendix A) include the notions that teachers are the best teachers of other teachers; that teachers must be involved from across the disciplines; and that knowledge about the teaching of writing comes not only from research but also from practice. Its emphasis "put a premium on what is working rather than [treating] classroom teachers as diseased, damaged, and needing repair" (Gray 45).

The Bay Area Writing Project became an example for other U.S. projects that were funded, as the BAWP was, by the National Endowment for the Humanities. These projects, grouped together as a federation of regionally autonomous sites, were bound together in a network committed to the BAWP program design and staff-development model. This federation of projects, known as the National Writing Project, encouraged teachers across the disciplines to teach writing as a mode of learning. This movement became the "Writing Across the Curriculum" movement of the 1980s.

Linda Bense-Meyers recently suggested that increasing the amount of writing a student must do is akin to opening a Pandora's Box of evils: for students to write, they must read, be able to solve "real-world" problems, and be aware of cultural values, and of their responsibility as communicators (1). To address all these problems simultaneously is not only good teaching, as the next section is intended to show, but necessary for graduates to be increasingly literate, thinking and responsible citizens. With the growing volume of information swelling curricular agendas, focus needs to shift to helping students learn how to learn and to teaching higher-order cognitive skills like problem-solving, analytical reasoning, and critical thinking (Rousseau 2).

As stated earlier, this "quiet revolution" falls largely, but not exclusively, under the auspices of the "Writing Across the Curriculum" Movement. In

the many places where writing across the curriculum programs flourished, their interdisciplinary ventures inevitably led to integrated approaches to the teaching of reading, writing, critical thinking, and oral communication (Fortune). Increasingly colleges and universities, in collaboration with secondary schools, are developing programs and projects across the curriculum under such titles as "Literacy Across the Curriculum" (Dawson College, Montreal), "Critical Literacy" (Georgetown University, D.C.), "The Institute for Writing and Thinking" (Bard College, New York), and the "Task Force on Writing and Critical Reasoning" (University of Tennessee).

In their search for excellence, many educators are using collaborative learning activities and a variety of other approaches that involve students' active participation (Chickering and Gamson 5). In the following section, the reasons for this "quiet revolution" in teaching will be examined in the light of findings of researchers and teachers about the nature of learning. In its necessary brevity, this may read as simplistic, dry and theoretical. Its application to classroom teaching and learning, however, is complex, dynamic, and rich in experience for both students and teachers. In subsequent sections, more detail will be presented about subject-based teaching of thinking, reading, and writing, with descriptions of programs already in place.

The Nature of Learning and Teaching

Cognitive Research

During the last two decades, cognitive psychologists, linguists, and educators, reacting in part against the assumptions of behaviourism, have been examining what learners actually do, how they acquire, organize, remember, and use knowledge. Investigators are questioning the notion of learning as an upward sequential climb of developmental stages (Harste, Woodward, and Burke 90, 105). They are finding that development of higher cognitive skills extends over a lifetime and is affected by experiential, linguistic, and emotional factors. They are finding that learning is a life-long process and therefore it is essential that students in post-secondary institutions should learn how to learn (Cross, Adults 48-49; Rousseau; Young 10-11). They have been asking what readers and writers think about, what decisions they make, how they solve problems, and how they reach understanding. They have been encouraging learners to articulate their unconscious actions in the hope of improving learning. They have been looking at differences between good and poor readers, writers, and problem-solvers. More recently, they have been examining convergences of theory and research about reading, writing, and oral language (Sternglass 1-11). Their attempts to clarify what is known about composing, comprehending, and learning have yielded insights into the connectedness of these activities. Such insights coalesce in the

concept of learning as a "Gestalt" of understanding, an event larger than the sum of its parts.

As a result of these investigations, learning is now described as a **multi-faceted, complex interaction between learner, teacher, knowledge domain, and situation, with language playing a crucial role as the principal instrument of interaction.** Knoblauch and Brannon (467) elaborate this description and write that

[K]nowing is an activity, not a condition or state, that knowledge implies the making of connections, not an inert body of information, that both teachers and students are learners, that discourse manifests and realizes the power to learn, and that teaching entails creating incentives and contexts for learning, not a reporting of data. Specifically, learning is the process of an individual mind making meaning from the materials of experience.

To set a framework for later discussions in this report, it may be helpful to examine more closely each element of this interaction, starting with a look at the learner.

The Learner

Implicit in the interactive view of learning is the critical importance of the learner's background to the learning process. "Comprehension is the use of prior knowledge to create new knowledge" (Adams and Bruce 23). The role and nature of prior knowledge, or "schema" as it is called by some theorists, is addressed in almost all investigations into learning. Simply defined, "schemata" are organized networks of information embodying some aspect of knowledge and representing the individual's past encounters with the world. They are the building blocks of cognition, which direct perception and thinking and are progressively modified as learning occurs (Neisser 51-78; Rumelhart 3-26). Schemata can be described as combinations of many elements: general knowledge, language skills, values, learning style, emotions, and motives.

To engage in higher levels of thinking within a subject, one needs knowledge of the field, a well-developed schema of it. Experts have elaborate schemata related to their area of expertise. Nonexperts, on the other hand, may have acquired only bits and pieces of a schema. When experts read a poorly written text or listen to a lecture on a topic, their schemata enable them to piece the message together by filling in missing information about concepts and their relationships. Most learners, the nonexperts, do not possess enough information to reason through missing pieces. It is through real experience with a topic and language interaction that schemata are built. Obviously, the language and intellectual abilities of the learner influence learning.

Just as the learner's background is critical, so is the learner's **active involvement** with the topic. As Piaget has shown, new concepts have to be actively constructed by each individual by incorporating new information into existing mental structures. This is done not only through listening and reading, but through talking, writing, observing, and doing. Since learners vary in their prior experience and knowledge, they need opportunities to link new concepts with their own experience. In the usual "transmission" mode of instruction, many linkages are never made. The goal for instructors, then, is to devise ways to involve students in more effective learning through personal interaction with the subject matter. As Britton pointed out in "Talking to Learn," it is through group efforts at understanding, collective solution of problems, joint exploration through expressive talk, struggle to organize thoughts and feelings, that explicitness is developed (81-115). At another time he wrote, "most of the important things that there are in the world were probably first discussed in expressive speech with somebody who was in the context" (*Prospect* 97).

The learner's motivation, attitudes, interest, beliefs, and values also play a crucial part in learning. Linked under the concept of **affect**, they are often referred to as vague concepts, but teachers everywhere know their crucial impact on student achievement and their own performance in the classroom. Probably because of its elusive nature, affect has not been widely covered in the literature on cognitive psychology and cognitive training in general (Meichenbaum 419). However, in discussing studies of creativity levels of college students engaged in think-aloud, problem-solving tasks, Meichenbaum shows how poor performance can lead to negative feelings and further poor performance. Similarly, Baron argues that a person's use of thinking strategies may be affected by values, beliefs, and expectations. He points out that "when a person fails to use a strategy, this need not imply that he could not use it (or figure it out) if he cared to do so" (386). He goes on to say that "strategy instruction alone could produce students who can use all sorts of thinking strategies but who do not use them after school. Such instruction is like teaching a child to play the violin without at the same time imparting either a love of music or the habit of playing it" (388). In his model of "Attitude Influence in Reading Comprehension," Mathewson shows the relationships between reading comprehension, attitude, motivation, attention, and acceptance/rejection (655-676).

The Teacher

Teachers are influenced by many of the same factors that influence students' learning: background knowledge, degree of personal involvement in the teaching/learning process, motivation, teaching style, and so on. But it is in the **differences** between student and teacher that some of the barriers students face become most apparent. Teachers are the "experts"; their

schemata for the subject they are teaching are developed and extensive. By virtue of their training and profession, teachers are masters not only of the content but of the language and thought processes inherent in their subject. Because they are intimately acquainted with the specific demands of their subject, they are the most qualified to enhance student literacy. Many have difficulty, however, understanding or accepting the difficulties of their students. For them, the gap between them and their students is overwhelming. They often fail to break down learning tasks into manageable units of study for students. Expecting students to reach higher-order levels of thinking and doing before first coming to grips with the basic language and concepts is like telling a toddler to go out to play in daddy's shoes. She may be able to take a few steps in them, but she will certainly not be able to play hopscotch or turn cartwheels.

Many researchers in language and learning theory point out that teachers need to see themselves as coaches, not lecturers, devising learning experiences and assignments to involve students with the language and thinking of the subject in order to enhance their learning of the subject. This is most effectively done through balancing instruction in both process (how to read, write, and think) and content (curriculum) within a meaningful context. If such instruction is carefully planned, "there is no wasted time, no separate emphasis, no risk to the curriculum. The strategy **does** require modification in teaching behaviour, changes in the role of both teacher and learner; but the modifications and changes are realistic and practical" (Herber 11). Talk as well as informal, speculative types of writing have important roles in effective learning. For teachers to allow this and not feel time is being wasted, they need a clear understanding of learning processes. Few have had access to opportunities for training in this area.

Knowledge Domain

A third element in this interactive view of learning is the knowledge domain, subject matter, or curriculum as it may be called. Its importance is often overlooked when student achievement is debated. To students, the curriculum presents new, complex, and often abstract concepts combined with intellectual and linguistic demands for which they have had little or no explicit preparation.

The contexts for writing may be so different from one classroom to another, the ways of speaking in them so diverse, the social meanings of writing and the interaction patterns so different, that the courses may be for the student writer like so many foreign countries. (McCarthy 260)

Stefan Bosworth of the City University of New York Medical School recently pointed out that up to forty percent of the words in science texts are

unfamiliar, technical words and that even "good readers" have trouble reading them. The density of new curriculum, i.e. the large number of new concepts encountered in a short period of time, can be intimidating to students. For instructors, the need to "cover" this content often overrides the need to help learners create meaning. Furthermore, segmentation of curriculum into often isolated units of work presents problems for students struggling to find meaning and build relationships. Few educators would dispute the notion that curriculum has a dual purpose: to teach students something and to teach them how to learn. The first part of this, the content, is always addressed; the second, however, is seldom considered other than to assume it is occurring.

Learning Environment

A fourth and also vitally important element in learning is the classroom situation, the learning environment. In 1969, Carl Rogers showed that learning is enhanced in an environment in which informal self-directed activity proceeds without external threat (159-162). In 1987, in an article entitled "Teaching for Learning," Patricia Cross distilled the findings of several decades of research into three major conclusions about how to promote student learning:

- When students are actively involved in the learning task, they learn more than when they are passive recipients of instruction.
- Students generally learn what they practice.
- If teachers set high but attainable goals, academic performance usually rises to meet expectations. (4-5)

Cognitive psychologists have also shown that effective learning occurs when learning tasks are perceived as relevant to the learner, and when the learner must satisfy a purpose (Rogers 158-159; Smith 389; Frase 42-64). This relevance is constructed by the learners as they engage in meaningful activities in meaningful contexts. The best learning situations are those in which students "develop their own reasons for participating in [an] activity rather than simply completing the task because it has been assigned by the teacher" (Langer 123).

Role of Language

Language has been referred to as the exposed edge of the learning process. So often in classrooms, the usual lecture and constrained question-answer dialogue preclude opportunities for student engagement in the language and thinking so crucial for learning.

It is as talkers, questioners, arguers, that our [students] do much of their most important learning....When [students] are free to talk, teachers are free to observe and to understand what kind of

learning is going on. For in the end, the teacher can only make sense of his [students] making sense. He can only work with their meanings. (Rosen 127)

Implicit in this view is a form of discourse that encourages learners to take risks, to try out half-formed ideas, in a way they dare not do in making a public speech or writing a term essay. Relaxed talk, relatively free from fear of making errors, is more likely to help students learn than, for example, the more formal exchange of teacher question and student answer with a whole class audience.

In a similar way, informal, personal writing plays an important role in learning. Learning situations that include opportunities for exploratory, reflective writing enhance learning. A more comprehensive discussion of this follows in the writing across the curriculum section of this report. As James Britton states in his book Prospect and Retrospect, while talk has its role to play in making meaning, "writing, as premeditated utterance, may have the effect of sharpening the process of seeking relevance, as well as harvesting for the writer connections first explored in speech, his own and other people's. . . . Writing puts the onus for effort on each member of the class" (125-126).

The challenge for teachers is to help students bridge the gap between their limited background knowledge and the demands of the curriculum, and to arouse in students a desire to learn. The challenge is also to use regular curriculum materials and assignments as vehicles for writing, reading, and thinking instruction. By careful devising of reading and writing assignments, instructors are better able to develop students' higher levels of comprehension and performance (Skelton 44-55). Teachers may usefully help students analyze texts and, in turn, set the stage for students to discuss, to explain, to write about their reactions and understanding (Cooper 1-8). This is often hard for teachers, as their own processes of reading, writing, and thinking are so internalized that many are not sure how to generate these activities in their classrooms.

Through the sections that follow, it is hoped that instructors will gain an understanding of the importance of language interaction in the learning process and thus recognize the need to devise ways of creating such interaction.

READING AND LEARNING FROM TEXT

Introduction

The textbook has long been a central feature in instruction at the post-secondary level. Until recently, teachers have assumed that college students possess all the skills necessary to learn efficiently from the assigned texts. Little has been done other than to prescribe a text, require that it be read, and test for results. While reading comprehension has clearly been an important variable, it has received little attention.

This is now changing as new perspectives on text learning challenge traditional approaches to post-secondary instruction. Developments in the field of reading research have fuelled new interest in this aspect of learning. Emerging is a more complete understanding of text-centred learning and the relationship between that learning and effective instructional design.

The new developments in reading research have resulted in a perspective termed "content reading." Herber first noted that the unique contribution of content reading was the emphasis on reading processes as well as content (2-6). Conventional post-secondary instruction had focussed on content with little interest in the processes required to learn from the college text. Now, as more is understood about the reading-learning-thinking process, instructional strategies are being developed to facilitate learning from text. The post-secondary student can now be taught how to be more effective in using the college text as an aid to learning. The result is a more independent and efficient learner.

The purpose of this discussion is to present key concepts needed for a more complete understanding of the reading-learning-thinking process. From this, points can be made relative to instructional strategies that enable post-secondary students to learn more readily from text.

Learning From Text

In a summary of the contribution of reading research, Duffy noted four key concepts that apply post-secondary reading processes (3-7).

1. The mature reader derives information more or less simultaneously from many levels of analysis, including the graphophonemic, morphemic, semantic, syntactic, pragmatic, schematic, and interpretive.
2. Reading is an interactive process: analysis does not proceed in a strict order from basic perceptual units through to the overall interpretation of a text, but hypotheses at any level may facilitate or inhibit hypotheses at another level.
3. Reading is a constructive process. A text does not have a meaning by virtue of its wording and syntax: rather, the text is an abbreviated recipe from which the reader elaborates a meaning based on analysis of the author's intentions, the physical and social context, and the reader's knowledge of the topic and genre.
4. Reading is a strategic process. Skillful readers continuously monitor their comprehension: they are alert to breakdowns and selectively allocate attention to difficult sections as they progressively refine their interpretation of the text.

A discussion of each of these concepts will help to clarify the effect this research has had on understanding reading, thinking and learning at the post-secondary level.

Multi-Level Analysis

The complex process of reading involves much more than sounding out words. Complicated linguistic and psychological processes enable mature readers to draw upon prior knowledge, memory, language fluency and text structure to learn from reading. As the reader seeks for meaning, he is constantly making decisions about which text elements lead to understanding (Shafer 31-42). Variables of greatest interest in reading post-secondary texts are the semantic, syntactic and organizational text features.

Alvermann noted that these features are arranged within larger relationships that guide meaning. Learning from text requires that the reader recognize and use hierarchical relationships within the text (38-51). These organize the content in terms of major and supporting concepts. To sort out these relationships and understand the text, the reader must be sensitive to the patterns and cues that carry and reinforce meaning. At times the focus may be on vocabulary (semantics), while at other times the relationships between words (syntax) may be more important. Patterns or the organizational flow of key concepts may also contribute to comprehension.

As the reader searches the text for meaning, he moves through the text features looking for those elements that guide comprehension. This search is not linear but dynamic, drawing on all available text features. Comprehension is inhibited when too few cues are recognized or employed. Conversely, comprehension is facilitated when instruction makes the reader sensitive to those text features which facilitate understanding.

Interactive Process

Brozo discussed student awareness of linguistic connectives in text. His conclusion was that mature readers did not process text features individually, but that considerable "bridging" took place. This consisted of using the relationships that existed among the text features. Readers who "bridged" were more successful in learning from text.

Smith (151, 162-164) distinguished between immediate and mediated meaning identification. In immediate comprehension, the reader was able to relate (or bridge) sufficient text features in order to understand. Mediated meaning recognition required that the reader build a hypothesis that could then be tested by an analysis of available text features. As the hypothesis is evaluated, perceived meaning is verified or modified to match the text's intent. For Smith, the driving force behind this process was the priority of overall meaning for readers. It took precedence over any other one or more text features. The whole, in the reading process, becomes greater than the sum of the parts.

Comprehension becomes, for Smith, the reduction of uncertainty as the reader integrates the text features until meaning is recognized. This reduces uncertainty further and strengthens comprehension.

This research suggests, then, that instruction that assists the reader in building the "bridges" or using the relationships between text features will facilitate learning.

Constructive Process

One of the major results of recent reading research has been an understanding of the role of a reader's prior knowledge in the comprehension process (Readence 13-18).

Rumelhart (3-26) described knowledge as being "packaged into units," which he termed "schemata." These packages of knowledge contain not only information about something but awareness of how the knowledge can be used.

When a reader approaches a text, he considers the new information in terms of his existing schemata or available prior knowledge. This is what the reader brings to the reading task. Comprehension is affected by the reader's ability to use his prior knowledge to interact with new concepts found in the text.

Comprehension is the result of an interaction between the reader and the text. At all levels of this dynamic interplay, the reader notices various features (semantic, syntactic, etc.) as he searches for meaning. Prior knowledge or existing schemata affect the efficiency with which the text features can be processed for meaning.

It is the interaction between what the reader brings to the text and the text itself that finally results in comprehension. Comprehension becomes a constructive task in which the reader restructures the text in terms of existing schemata or knowledge. This results in a modification of knowledge, and, ultimately, new learning. The cycle repeats itself as the reader becomes more aware and effective in the reading-thinking-learning process.

Instruction that is designed to assist the reader in the construction of meaning fosters content mastery. Not only do students learn "what," but they learn "how."

Strategic Process

Successful reading implies a degree of self-consciousness or "metacognition" in the reader. He must understand the processes involved in reading and thus be able to effect his own learning (Tei and Steward 46-55). Such awareness includes the ability to use self-regulating mechanisms that ensure understanding. Examples include checking outcomes, planning approaches, evaluating effectiveness of action taken, testing and revision of reading strategies, and remedying difficulties encountered (Baker and Brown 21-44).

Successful learning from text, then, requires that a reader be aware of how learning is progressing. By developing a metacognitive awareness of his own

reading, a reader may monitor himself and increase the efficiency of his reading. The mastery of such strategies promotes independence in the reading, learning, thinking task and enables the reader to proceed into new learning with confidence (Singer and Donlan). Metacognition can be summarized as learning how to think about our thinking (Lundeberg 407-432).

Cognitive Processing Approach to Instructional Design

Many instructional approaches are being developed from the new findings in reading research. The cognitive processing approach is one model that has proven successful in facilitating text learning.

Most conventional post-secondary instruction is linear in design. The linear approach to instruction has as its foundation a set of logical objectives, task hierarchies, and instructional sequences. These variables are external or independent of the learner. In contrast, the cognitive model places emphasis on student prior knowledge, focussing of attention, learning strategies and student encoding behaviours. These variables are within the learner and can be used to facilitate interaction with content. Some have contrasted the two models as being "data driven" or product-centred (the linear approach) and "concept driven" or process-centred (cognitive approach). For the purposes of this discussion, the cognitive perspective will be used.

Learning occurs as prior knowledge interacts with new knowledge through an application of a processing strategy. As the student approaches new information, he anticipates how that information will fit with what he has already experienced or learned. He first automatically detects certain features in the information that he recognizes and then initiates a controlled search to determine the meaning of the rest. Learning occurs as the learner interacts with the new information and restructures it in terms of his existing knowledge.

This process can be facilitated by instructional design. Instruction can activate learning by providing selective cueing that directs the student to apply what he knows to existing new knowledge. The knowledge can also be externally modified to provide structure that activates key learning processes. Such modifications are called learning guides, as they serve to assist the learner in applying processes that facilitate restructuring of new information. Advanced organizers such as graphic organizers are common examples of learning guides.

New information must be manipulated, enhanced, and processed until such interactions result in the learner being able to integrate it with existing

experience. If instruction is designed to facilitate this process, cognitive efforts become more efficient as the learner is free to attend to higher order thinking processes. The learner is then focussing on important complex concepts rather than pieces of information. Learning is therefore not the result of exposure, but of experience in restructuring new information.

Post-secondary Reading Programs

Educators agree that effective teaching should convey strategies which assist students to become independent in text learning. Vacca captured the importance of effective text comprehension in this statement: "Students learn how to learn from content materials through effective teaching, which facilitates comprehension and concept development" (1). If post-secondary education is to prepare students better for the changing future, independence in text learning is important. Teachers need to pay attention to the processes of improving comprehension as well as to the mastery of specific content.

What models of post-secondary teaching have been found effective in facilitating both text comprehension and concept development? A review of the current literature will show that little is being done at the post-secondary level. For example, Conley and Murphy reported that little research had been directed toward integrating teaching effectiveness and content reading (14-24). The pattern has frequently been to assign college reading development to a specialist in reading and study skills. A review of the recent yearbook (1988) of the College Reading Improvement special interest group of the International Reading Association confirms this. Of the program models described and the instructional strategies discussed, few focussed on the classroom. Most came from experience in a Reading and Study Skills Centre. It seems that the new developments in reading research are being implemented by specialists, but not being applied across the college curriculum to improve instruction.

Singer and Bean have addressed this problem at the secondary level (161-184). They have designed several learning-from-text models that have application in secondary content learning settings. These models typify a wide range of strategies that are having a real impact on secondary content instruction. Yet the potential advantage for post-secondary instruction remains hidden in the Reading and Study Skills Centre.

Peters suggested that advances in content reading at the secondary level are dependent on several key variables. Some of these are applicable in the post-secondary setting.

1. Have available a content reading specialist.
2. Enable the content reading specialist to work with all content instructors.
3. Involve a wide range of instructors in developing instructional strategies that effect learning from text.
4. Involve a wide range of faculty in reaching a consensus on the essential reading processes or strategies necessary for success in a given content area.
5. Provide support services (i. e. reading, counselling, and instructional design) to support content reading efforts.

Rubin (5-20) defined the difference between a traditional reading and study skills instructor and a content instructor as a matter of orientation. The understanding deemed important by the reading specialist was in reality even more important to the content instructor. Similarly, the skills of the Reading and Study Skills instructor were even more effective in the hands of a content instructor. Such an orientation would enable content teachers to focus on process as well as product. Learning how to learn from content text would become part of the instructional approach. More effective instruction would result.

Our alternative is to fall into the trap identified by Confucius nearly 2500 years ago. He said:

The teachers today just go on repeating in rigmarole fashion, annoy the students with constant questions and repeat the same things over and over again. . . . As a result the students hide their favourite readings and hate their teachers, are exasperated at the difficulty of their studies, and do not know what good it does them. Although they go through the regular course of instruction, they are quick to leave when they are through. This is the failure of education today.

CRITICAL THINKING INSTRUCTION

The Nature of Critical Thinking Instruction

While it would be an oversimplification to pretend that there is wide agreement on exactly what constitutes critical thinking, an examination of pedagogical technique indicates that there is a broad general consensus about many of its ingredients. To understand the elements of this consensus, it is instructive to look at various views about the purpose of critical thinking instruction, at its history, and at some of the pedagogical issues in the field.

As a preliminary to these discussions, the following list of critical thinking processes is offered as a tentative characterization. This list, taken partly from Kurfiss, is not intended to be comprehensive. It consists of a heterogeneous collection of skills, attitudes and strategies for reasoning, some of which require self-conscious learning, others not:

1. Questioning the basis for belief.
2. Recognizing when a conclusion is based on incomplete information.
3. Discriminating between observation and inference, fact and conjecture, analysis of structure versus interpretation of meaning.
4. Recognizing that words are symbols for ideas and not the ideas themselves, and thus that knowing the word does not necessarily mean that one understands the concept.
5. Probing for unstated assumptions.

6. Drawing inferences from evidence and recognizing when inferences are tentative.
7. Reasoning deductively and hypothetically.
8. Discriminating between inductive and deductive reasoning.
9. Testing one's own line of reasoning and conclusions for internal consistency.
10. Becoming aware of one's own reasoning processes and being able to select appropriate strategies.
11. Stating a thesis or hypothesis and supporting it with appropriate reasoning or evidence.
12. Welcoming diversity and accepting the tentativeness of knowledge.
13. Identifying the values or ethical issues underlying a dispute.
14. Articulating sympathetically the point of view of someone who disagrees with one's own view.
15. Being precise in the expression of one's own claims and views and those of others.
16. Evaluating impartially the positions of oneself and others.
17. Selecting the considerations most significant and relevant to a particular topic or issue.
18. Having developed intuitions about the plausibility of factual claims.
19. Generalizing, in an appropriate way, conclusions reached and significant points learned in one context to other similar but new contexts.
20. Using a critical internal dialogue to develop and evaluate solutions to a problem.

Purposes of Critical Thinking Instruction

Critical thinking is essentially concerned with **reasoning**. It involves investigation of various forms of reasoning (deductive, scientific, moral, etc.) and modes of evaluating reasoning, as better or worse. Since the processes by which reasoning is investigated and evaluated are themselves reasoning processes, critical thinking is **self-conscious**, or in another terminology, **metacognitive**. In learning **about** reasoning, students are learning **to** reason, and to reason **well**.

The tradition of argument in favour of critical thinking instruction divides into two main streams:

- 1) its role in promoting educational achievement, and
- 2) its role in facilitating "good citizenship".

Under the first heading, it is expected that critical thinking instruction will enable students to develop their skills in areas such as problem-solving, deductive and inductive reasoning, generalization, argument analysis and evaluation, as well as those of successful interaction, through reading and writing, with the appropriate knowledge base. Essential to the most enlightened forms of academic instruction is the concept of the student as an **independent** thinker within a **community** of thinkers bound by a concordance of approach. Critical thinking instruction speaks to both of these aspects, in so far as it encourages the student to adopt a **critical** attitude to the material she is confronted with, but to evaluate it within the **conventional** limits of appropriate methods of reasoning. In this way one hopes to avoid the caricature of education as the ingestion by rote learning of factual material to be regurgitated at the final exam. This view of the purpose of critical thinking instruction connects it closely with the ideal of "learning to learn."

Under the second heading, it is argued that the independence of thought fostered by critical thinking instruction is morally necessary for participation in a democratic system of government (Glaser; Sabini). With this in mind, many textbooks for use in critical thinking courses concentrate their examples in the area of moral, social and political issues (Johnson and Blair). Without denying the significance of this global argument, it can also be agreed that critical thinking instruction provides for a whole host of specific skills helpful to participation in contemporary society. In a rapidly changing world, we need the ability to assess and select from among competing lifestyles (Scriven); in the era of mass communication, we need the ability to distinguish between information and propaganda (Postman); in the face of increasing job obsolescence, we need the flexibility to learn new tasks and adjust to new roles (Daly). Critical thinking, both in terms of the skills it develops and as a component in learning to learn, enhances just those abilities.

There is no reason to suppose that these two broad classes of purpose for critical thinking instruction are incompatible. It would seem to be appropriate, furthermore, for both of these important purposes to be recognized in the development of curricula incorporating critical thinking instruction. The divergence between the two kinds of purpose does raise issues about the relationship between skills and content (for example, choice of examples) which will affect the way critical thinking is included within the curriculum.

The outcome of this discussion of the purposes of critical thinking instruction is that critical thinking involves taking an independent stance in relation to the views and information, whether in formal study or in life in general, with which one is confronted. This characterization of critical thinking can be regarded as consensual among theorists and instructors. Superimposed upon this consensus are differences (of background, emphasis, interpretation, fact and value) which must be examined to give an adequate picture of the developing field. This is the purpose of the next two sections.

History of Critical Thinking Instruction

Critical thinking instruction, in its broadest sense, has always been a component of enlightened post-secondary education. That is to say, there have always been educators and programs which aim to maximize rational analysis and independence of thought. What has happened over the last twenty or so years is that a conscious effort has arisen to channel these less systematic attempts into a coherent, organized and self-aware approach to the development of higher order thinking abilities. The recent history of critical thinking instruction (in its systematic form) has produced a variety of methods. Originally great emphasis was placed on free-standing critical thinking courses. Now there is a growing sense of the need to supplement these with across-the-curriculum initiatives.

At the university and college level in North America, critical thinking instruction developed over the last twenty years as an outgrowth of philosophy courses in logic. Such courses were taught traditionally in a formal mode, employing the symbolism of the quasi-mathematical logic systems. While this branch of learning remains important both within philosophy and outside it in areas like computing science, concern arose that these courses did not provide sufficient transfer to other academic areas, or to "real life." In other words, it was felt that although formal logic provided training in a very specialized type of reasoning, it did not help students develop their reasoning abilities in the areas where these are most usually required. During the seventies, then, there began an upsurge in courses in "Informal Logic," designed to enable students to understand correct forms of reasoning and hence to enhance their own reasoning skills. These courses investigated reasoning in natural language without excessive reliance on the tools of formal symbolism. (Some textbooks, and some courses taught today, retain some link with the past by using formal approaches in a limited way.) Although these courses were taught still within philosophy departments, there was a gradual trend away from a focus on exclusively philosophical reasoning. Early textbooks (e.g. Johnson and Blair) used examples of reasoning from other academic disciplines and from social and political life,

letters to the editor, for example. Many courses included an introduction to scientific reasoning.

The transformation of informal logic into critical thinking proper, where it has occurred, has involved a broadening, as opposed to a replacement, of the range of reasoning abilities covered in instruction. As well as the traditional concentration on proof, derivation and fallacies, instructors and textbooks are looking more and more at the application of such concepts as plausibility, authority and controversiality. As well as taking arguments to be inert expressions of the support for a thesis, they are treating argument as an interactive, dialogical process. As well as trying to teach students to reason well, they are attempting to inculcate habits of questioning and independent thought. These extensions of the range of relevant reasoning abilities entail moving beyond the subject matter of argument and support for conclusions. Also involved are explanation, problem solving, abstraction, generalization, communication and a host of other manifestations of rationality.

At this point in the history, we come to the flowering of critical thinking as a discipline which is in the process of carving out its own subject matter. This is the point where diversity of approach masks the underlying consensus about subject matter and pedagogical technique. It is also the point where significant connections become apparent between the goals of critical thinking itself and those of other academic disciplines in so far as they concern the reasoning abilities of students. This is reflected in the fact that courses in critical thinking are no longer taught exclusively in philosophy departments, but also in other areas of the humanities and social sciences, as well as in the sciences and vocational programs.

This flowering of critical thinking instruction has created lively debate within the field on a number of important pedagogical issues. As a result of the discussion of these issues, educators have moved towards the concept of teaching critical thinking across the disciplines as an essential requirement for fulfilling the goals of critical thinking instruction. In the next section, some of these issues are examined in order to explain the rationale for critical thinking across the curriculum.

Issues in Critical Thinking Instruction

Critical and Creative Thinking

There has been a history of distinguishing, in educational theory and practice, between critical thinking and creative thinking, typified by the CoRT Thinking Program developed by Edward de Bono. The former has been characterized as convergent, logical, one-dimensional, goal-directed, rule-governed; the latter as divergent, imaginative, multi-dimensional, spontaneous, open-ended. Accordingly, there has been disagreement among

educators on which kind of thinking it is more important to encourage in students. The position taken here is that both should receive emphasis: this is because we dispute the claimed radical differentiation between critical and creative thinking.

It can be argued that this differentiation is more a question of emphasis than of substance. In practice, as well as in the theoretical characterizations mentioned above, creative thinking places its emphasis upon process as opposed to product. With critical thinking, it is the other way around. Thus, in the case of creative thinking, the characterization given above is accurate when applied to the process by which alternative hypotheses about the solution to a problem are generated, but not when applied to the selection of the alternative which is to be presented as the solution, and justified as the (or a) correct solution. Contrariwise, the characterization of critical thinking is accurate when applied to the presentation of a solution to a problem, or judgment about an argument, action or whatever, but not when applied to the process by which that solution is generated among a number of alternatives. Within the creative approach, the selection of a solution from among alternatives has to be justified, a convergent process. Within the critical approach, the generation of alternative solutions, or modes of attack, must occur as a creative, divergent process before an evaluation of those alternatives is made. Thus, in application, each "type" of thinking inevitably involves the other (Bailin).

The outcome of these considerations for critical thinking educators is the pedagogical advice that creative thinking processes might aid students in generating solutions to problems set. For curriculum planners the moral of the story is that both approaches should be represented in the curriculum, and in a complementary fashion. The emphasis in this report, given the current nature of the curriculum and the larger society which forms its context, is on the development of critical thinking, which is felt to be in greater need of support.

The major rationale for this is that problem-solving and academic activity of any kind are ultimately judged to be successful in terms of the **product**. While creative thinking enriches the process by which ideas are generated, critical thinking is always required for the last, important step. We are not satisfied with a plethora of possible solutions; we want a solution which works.

**"Holistic" versus
"Technical" Critical
Thinking**

The distinction between "holistic" and "technical" critical thinking is a terminological replacement for the distinction, due to Richard Paul (1982), between critical thinking in the "strong" and "weak" senses. In a recent paper, he writes:

I emphasize the importance of recognizing and highlighting a fundamental distinction between two distinct conceptions of critical thinking skills: a “weak” sense, understood as a set of discrete micro-logical skills extrinsic to the character of the person, skills that can be tacked onto other learning, and a “strong” sense, understood as a set of integrated macro-logical skills intrinsic ultimately to the character of the person and to insight into one’s own cognitive and affective processes. (Paul, unpublished)

What Paul means by “micrological” and “macrological” skills needs elucidation. An example of the former would be the ability to express an argument as an ordered set of statements identified as premises and conclusion. An example of the latter would be the ability to evaluate impartially the contributions to the discussion of a difficult issue of one who disagrees with you. The goal of critical thinking is set high when one aims at developing abilities of the second type: these are not merely **techniques** but rational **attitudes**. “Holistic” critical thinking instruction, then, goes beyond the mere assimilation of techniques, though it includes these too.

The distinction is partly covered by that, already discussed, between informal logic and critical thinking proper. The “holistic” sense places great emphasis upon independence of thought and self-consciousness about one’s thinking processes (metacognition). It supports the development of what Paul calls “emancipatory” reason — “skills essential to the free, rational and autonomous mind” — as well as “technical” reason. An important feature of the two approaches is that, whereas the “technical” sense puts stress on the **form** of modes of reasoning, e.g. arguments, the “holistic” sense requires an investigation of the **content** of pieces of reasoning. For example, one can decide whether an argument is **deductively valid** on formal grounds alone, but to decide whether a claim is **plausible** requires familiarity with the context in which it arises.

As reported in the section on the history of critical thinking instruction, the direction of the movement is now clearly towards the “holistic” sense and away from merely the “technical” sense, though the skills inherent in the latter are retained as part of the tools for developing emancipatory reason. There are strong arguments that they **must** be retained, in fact, in so far as it is the concepts and distinctions of argument analysis and evaluation which enable any person to hold a steady position at anchor on the rhetorical sea. Without these tools, it is very difficult not to be swayed by irrational forms of persuasion and mistaken or fallacious arguments.

The theoretical discussion about the relative advisability of the two approaches is somewhat defused by the observation that the techniques of the “technical” sense are essential to the development of critical thinking in

the "holistic" sense. This report takes the position that critical thinking in the "holistic" sense should be the goal of critical thinking instruction. Therefore, it supports the retention of instruction in the skills which make up the "technical" sense. Later it will be seen that this plays a role in the argument for critical thinking across the curriculum.

**Natural versus
Self-Conscious**

Given that one accepts that critical thinking skills are important in teaching, there are two ways one can go about helping students develop them. The "natural" way is to display those skills in one's own approach to the subject, and to set exercises which demand them for successful completion, in the hope that without being mentioned during class time they will be ingested by osmosis. It has been the experience of most current educators that, when they were students, some of their teachers employed these methods, and with success. It should be remembered, however, that at the time, these students were part of a highly selected elite, who could be expected to have more highly developed critical skills than today's broader intake of students. What may be more appropriate today is the "self-conscious" way, which goes beyond the osmotic method to spending time identifying and discussing the kinds of skills and processes which make up critical thinking. Educational and cognitive science research suggests strongly that the latter approach is more fruitful, and that it is necessary for developing critical skills in those students who are not numbered among the educational elite (Resnick 12). Accordingly, that will be the approach recommended by this report; as stated earlier, this is the direction in which critical thinking instruction is already moving.

**Domain-Specific
versus
Domain-Independent**

Of crucial relevance to critical thinking across the curriculum is the question of whether, and if so to what degree, critical thinking skills are domain-specific. Some theorists have argued that it is impossible to divorce critical processes from the content-domain in which they are applied, that this means that critical thinking abilities are not transferable to other areas of discourse, and that therefore critical thinking skills should be taught only within content courses (e.g. McPeck). The assumption of the philosophical, informal logic tradition, however, was always that critical thinking was a formal matter which relied not at all on specific content.

It seems appropriate to suggest that the truth lies somewhere between the two extremes. This is the position taken in this report and it is also the position supported by most critics of the "totally domain-specific" approach. Critical thinking is conceived of as an octopus, whose arms extend into all areas of human endeavour but whose head is the concentration on the general forms of reasoning available in a critical thinking course. Without

the arms, the head will die for lack of food; but without the head the arms cannot live in the first place.

That critical thinking abilities are not transferable does not necessarily imply that they should be taught only in content courses. An alternative response would be to incorporate discipline-based content into critical thinking courses in a more integrated way; there might still be an advantage in concentrating critical thinking instruction within a single course — it allows, for example, for the fostering of a self-conscious approach which it might be more difficult for content instructors to attain. Some steps have been made in the direction of creating texts which promote content inclusion in critical thinking courses. For example, Trudy Govier's A Practical Study of Argument facilitates this by using examples drawn mainly from academic disciplines other than philosophy.

Secondly, the vagueness of what is to count as a "domain" renders it unclear whether the failure of transferability which domain-specificity seems to imply is educationally significant. Is "science" a domain, or "chemistry"? Is there any reason to think that critical skills learned in relation to chemistry will not transfer to physics? The consensus among instructors of free-standing critical thinking courses is that the abilities they try to develop in their students are to a large degree domain-independent, and thus transferable (Ennis, 1981; Govier, 1983).

Of further relevance is the fact that the analysis of a piece of reasoning proceeds by **abstracting** from the content. This process is fundamental to the kinds of abilities critical thinking instruction endeavours to stimulate, for the whole point is to rise above the particular to the understanding of general patterns. With this general understanding one can apply the techniques of rational inquiry to new cases.

At the same time, it is hard to deny that critical thinking skills, in the "holistic" sense, are to some degree domain-specific. What counts as good evidence in physics, for example, is different from what counts as good evidence in sociology or history. Furthermore, one's status as an independent thinker, and as a citizen, depends upon an ability to assess claims made in these fields in an impartial and rational way.

The "octopus" view has as a consequence the suggestion that a mixed mode of critical thinking instruction is the most efficient. While there are general principles of critical thought which carry over from one domain to the next, their articulation within specific domains may differ, at least to some degree. It is reasonable to expect that, among instructors, content specialists would have closer acquaintance with the nuances of a particular discipline than critical thinking specialists. All this is contingent, of course, on content

instructors having the opportunity to develop, maintain and learn how to articulate their own critical thinking abilities.

As well as playing a role in collegial support and professional development in the last context, critical thinking specialists are important because they have the knowledge and skills, as well as the assigned instructional time, to go much more deeply into the complex processes of appropriate reasoning than do their counterparts in other disciplines. The exposure to reasoning skills which a student might find in a biology course (as the result of the institution of critical thinking across the curriculum) will of necessity be brief and partial. With the knowledge and skills gained from a previously taken critical thinking course, the student will more readily identify and integrate the content- and discipline-specific nuances. Without that prior ability, it will be difficult to understand them.

Summary

This extremely brief airing of some of the live issues within critical thinking education serves a dual purpose. First, it underlines the fact, basic to a critical approach to any subject, that the solutions to pedagogical problems are not to be found in a single, simple formula. The area of critical thinking instruction is a live, developing area, not a set of fixed techniques. Second, it indicates the directions in which the critical thinking movement is expanding, and some of the motivations for the part played in this expansion by the demand for critical thinking across the curriculum. The latter topic will be explored in the next section.

Critical Thinking Across the Curriculum

The above discussion of the nature of and issues within critical thinking yields two lines of justification for instituting critical thinking instruction across the curriculum. They are concerned with a) general reasoning abilities, and b) discipline-specific abilities and understanding of subject matter.

General Reasoning Abilities

One reason for having critical thinking instruction at all is that it is an important preparation for life in contemporary society. The success of this attempt depends in part on students coming to see critical thinking as an important process in living, not just as a set of techniques one employs on special occasions — for example, in a particular course. Critical thinking across the curriculum goes a long way towards stressing the ubiquity of the need for critical thinking by making sure it is recognized and employed throughout the whole of the student's experience. The appropriate habits of

rational and independent thought must be reinforced at all stages of learning, and in all contexts in which learning is taking place.

Furthermore, complementing free-standing critical thinking courses with across-curriculum critical thinking instruction allows for more depth in the analysis of problems and in the exploration of solutions. All examples employed in the development of critical thinking abilities have content; many of the abilities are general enough that a precise familiarity with a particular field is not required for successful application; however, this is not unrestrictedly so. At some point, it becomes necessary to appeal to background knowledge and expertise to assess whether a particular mode of reasoning is appropriate. While those who teach critical thinking courses have a great deal of background knowledge, they may be experts only in their own discipline. In other areas, a suitably trained instructor in a content area might be able to go into more depth on particular issues. The habit of pursuing reasoning in depth is important, and might thus be maintained and transferred to other areas of the student's experience.

There is every reason to expect such transfer of general abilities. Cognitive science research, as well as a number of programs currently in operation, strongly suggest that the same critical thinking processes are involved in reasoning in all sorts of educational contexts, both in the strictly academic and in the vocational (Resnick). The more critical thinking is learned across the curriculum, the greater will be the opportunities for successful transfer.

The above arguments apply to all areas of the curriculum, but there is one area which should be singled out for special attention, and that is reading and writing. The connection between reading, writing and thinking is of course obvious at an intuitive level — the raw material for reasoning is taken in through reading and the finished product is expressed through writing. Successful reading and writing, furthermore, clearly involve thinking critically about what is read or written. There is thus a very strong and simple argument for doing what educators in these fields have only recently begun to do, which is to incorporate critical thinking instruction into their basic methods in a conscious way (Resnick).

Discipline-Specific Abilities

The argument under this heading for critical thinking across the curriculum derives primarily from the extent to which some critical thinking and reasoning abilities are domain-specific. In so far as one of the main purposes of critical thinking instruction is to enhance performance in academic and vocational disciplines, the incorporation of across-curriculum instruction seems to be required. Again, depth in understanding the nuances of appropriate reasoning within a discipline is the main advantage which a properly trained discipline instructor has over a critical thinking specialist

(Resnick; Daly). The disadvantage is a comparative lack of self-conscious familiarity with the details of critical thinking abilities, which is why the maintenance and expansion of free-standing courses is also important.

Critical Thinking in the Classroom

A brief glance at the sorts of classroom activity which characterize critical thinking courses lends some insight into the gains to be made by adopting them across the curriculum, and into the theories of education and development which offer justification for using them.

Although lecturing can form a part of critical thinking instruction, for basic techniques and background explanation must be imparted, it is not the predominant form of activity. Interactive work on examples, group work, debate and verbal discussion are of paramount importance. Critical thinking instruction is:

- **Dialogical** - involving discussion between students, and between them and the instructor, about the issues used as examples of reasoning, and also about the techniques and concepts employed in the analysis and evaluation of reasoning. Discussion allows students to test and modify their understanding of course material.
- **Student-centred** - although there is a body of subject matter to be covered, the initial emphasis is on developing the skills and attitudes of the student, and this process must begin where the student is located on the continua of skill and attitude development. The aim is to enable each student to build on native abilities.
- **Collaborative** - students work together with each other, and sometimes with the instructor, on the solution of problems and treatment of examples. This offers further opportunities for self-correction early in the evaluation process.
- **Active** - passive ingestion of the subject matter is avoided; instead, familiarity with the techniques, concepts and habits of critical thinking is gained through use and practice.
- **Metacognitive** - the student is made aware of the processes and abilities to be gained through this form of instruction; otherwise it will not be successful.
- **Reflective** - as well as conveying information, the instructor must justify what is conveyed; this is a basic precept of adopting a critical stance, of course. It provides an important model for the attitudes to be presented as those of a critical thinker.

Good teachers already teach in a way which promotes active learning; good teachers who employ critical thinking instruction, whether in free-standing courses or across the curriculum, promote active learning by discussing its value, and the value of the techniques which promote it in relation to the specific subject matter of the course. They encourage having a position as an independent thinker by discussing with the class the pros and cons of such a position; in this discussion, the opinions of the class members are at least as important as those of the instructor.

In so far as this kind of approach can be incorporated into the teaching of subject area, courses will deepen the understanding of content, allow for more transfer of skills and general principles to other areas of content, and enable students to perceive what it is to be, and hence to become, practitioners of the relevant discipline. This development of attitudes and skills can be accomplished without sacrifice of content, since cognitive science shows us that information is more easily assimilated when it is understood in an active fashion and within an overarching explanatory framework (Resnick).

It can thus be seen that there is a strong case for introducing critical thinking across the curriculum in any post-secondary educational system. This introduction cannot, however, be accomplished at the cost of under-emphasising specific critical thinking courses, for these are required to give students the concentrated training in thinking skills which it is difficult for a content course to supply. A mixed system, which integrates both elements, has the greatest chance of significant success.

Empirical Studies of Critical Thinking Instruction

An unfortunate feature of the domain of critical thinking instruction is that very little research has been done on the effects of such instruction on student achievement. The little that has been done, in this and in related fields, however, justifies a cautious optimism about the value of critical thinking both within specific critical thinking courses and across the curriculum. In the latter instance, the small amount of literature on critical thinking studies is summarized in the 1987 report of the National Research Council in the United States (Resnick). A rigorous evaluation of the Guided Design program in engineering at West Virginia University, a program which includes training in thinking skills as they relate to problem solving, showed significant increases in grade point average for students in the program compared with their historical predecessors who had not taken it (careful controls being made for grade inflation) (Wales). An evaluation of the Venezuela "Project Intelligence" concluded that students gained extensively

in verbal IQ, reading comprehension and in the transfer of specific reasoning skills to other educational and practical tasks (Bolt, Beranek and Newman).

The last area in which studies have been conducted is on the effects of critical thinking instruction on "holistic" critical thinking abilities. As stated in the 1986 report of the New Jersey Basic Skills Council, longitudinal studies of college students indicate that advances in reasoning ability have significant effects on general belief-formation, developing in students a more questioning, more independent approach to their role as learners and as citizens (Feldman and Newcomb).

The most obvious outcome of this survey of the research literature on student achievement through critical thinking instruction is that an enormous amount of research remains to be done. What has been done is sparse, yet points in the direction of the advisability of critical thinking, both in free-standing courses and across the curriculum. More support for this position can be gained by examining students' subjective evaluations of the effect of critical thinking instruction on their own educational achievement.

A survey conducted for this report at a number of British Columbia colleges and two universities indicates a very high level of student belief in the effectiveness of critical thinking. Questionnaires were given to a total of 262 students in first-year critical thinking courses at Simon Fraser University and at the University of British Columbia, and to a total of 193 students in critical thinking courses at Douglas, Kwantlen, Capilano and Vancouver Community Colleges. At the end of a one-semester course, 93% of college students and 65% of university students reported that they considered that their training in critical thinking had helped them in their other studies. Among college students, 50% reported that it had helped them a great deal, 80% that it helped them to make greater sense of reading materials in other courses and 85% that it helped them to structure their written assignments in other courses in a clearer way. 58% thought it likely, and 31% certain, that their overall grades have increased or will increase as a result of critical thinking training and 90% said that they would recommend it to other students as a way of increasing academic achievement. Among university students the percentages were consistently lower than among college students, but roughly half thought that critical thinking training helped them with reading and writing, and that they would recommend the course to others as a way of increasing academic achievement (the figures were, respectively, 48%, 46% and 53%).

The results of subjective evaluations are not as strong a form of evidence as figures on actual performance, but they do provide some reason for concluding that critical thinking has a positive effect on student achievement.

Combined with the sparse but positive research on actual effects, they make a case for critical thinking instruction.

Perceived Need for Critical Thinking Instruction

As well as the small amount of hard data in favour of critical thinking instruction, it is appropriate to examine the perceived need for such instruction among educators and in the business world.

First of all, the plain fact can be noted that there is a rapidly growing interest in critical thinking instruction at all stages of the educational process in North America. Programs are in place at the post-secondary level, both for free-standing courses and for across-curriculum teaching. Critical thinking courses are used as threshold filters for career programs at a number of institutions in British Columbia. For example, at Simon Fraser University, a satisfactory standing in Philosophy 001, a critical thinking course, Philosophy 110, an introduction to formal concepts of reasoning, or a basic English course is required for entry into such programs as computing science, economics and business studies. Criminology requires one of four basic philosophy courses, including Philosophy 001. Critical thinking skills are stressed increasingly at earlier levels ("Critical Thinking Stressed"; Lipman). In British Columbia specifically, a number of faculty members in the Education Faculty at the University of British Columbia are working on a variety of research projects in connection with critical thinking at the K-12 level (LaBar and Wright; Coombs). The writing of a number of reports, including this one, is also a testament to this interest. The interest extends, moreover, beyond the educational community to the public at large.

One important context in which the demand for critical thinking has been loudest is the world of business. A number of organizations, such as the Carnegie Foundation for the Advancement of Teaching and the Corporate Higher Education Forum, have echoed the call for the liberal arts graduate. The claim is that such graduates have acquired the flexibility of approach, the independence of action and the communication skills necessary for success in the rapidly changing business environment ("Arts Grads"). These are precisely the skills emphasized in critical thinking instruction.

Aside from the application of critical thinking skills in the area of employment, there is considerable weight behind the argument that critical thinking in the "holistic" sense is an important prerequisite for life as a citizen in a pluralist participatory democracy (Paul; Glaser).

There are thus important arguments, recognized by a wide cross-section of contemporary society, that critical thinking instruction has value both within

the academic sphere and as a preparation for life. These arguments apply alike to free-standing courses in critical thinking and to critical thinking across the curriculum, though the argument urged by employers in business might be construed to have special relevance to the latter.

The outcome of the survey of evidence above, and of the review of expressions of the perceived need for critical thinking instruction, is that there is justification for optimism about the value of critical thinking, within educational and societal contexts. The considerations discussed do not in any clear way distinguish between the value of free-standing courses taught in critical thinking and the incorporation of critical thinking instruction across the curriculum. It would seem to be reasonable, in the absence of further research, to accord with the theoretical position already here developed, namely that the mutual reinforcement gained through a mixed system, incorporating both free-standing courses and across-curriculum instruction, makes the mixed system the most likely candidate for successful implementation.

Programs for Critical Thinking Across the Curriculum

Overview

The purpose of this section is to examine the current state of programs for the teaching of critical thinking across the curriculum, in British Columbia and elsewhere. The major focus of comparison with British Columbia will be other areas of North America, since it is felt that these provide the best analogues in terms of educational context. No attempt to be exhaustive will be made in the description of existing program models. Instead, three institutions which have adopted critical thinking across the curriculum will be examined and compared. In addition, the status of critical thinking in the community college system in California will be described. This is an example of an educational system which has adopted across-curriculum critical thinking as a conscious and operationalized goal in education.

The survey of program models elsewhere in North America, in addition to the examination of the situation in British Columbia, makes it clear that the development of college curricula is proceeding, albeit unevenly, in the direction of increased emphasis on critical thinking instruction. In this movement towards establishing educational practices to accomplish the goals of such instruction, critical thinking across the curriculum is coming to be seen as the necessary extension to instruction already supplied in free-standing critical thinking courses.

**Critical Thinking
Across the
Curriculum in British
Columbia**

At most post-secondary institutions, critical thinking courses are free-standing with a variety of ranges of subject matter covered, from informal logic to more comprehensive critical thinking. At the University of British Columbia and Kwantlen College, however, critical thinking is taught as a component of a course which is essentially an introduction to formal logic. While there is a considerable amount of interest in and perceived need for the introduction of critical thinking across the curriculum at the post-secondary level, the description of actual programs in British Columbia is rather short. There is no organized and comprehensive treatment of this educational goal, but there have been attempts, mostly in an informal and piecemeal way, to incorporate critical thinking across the curriculum. This has been left largely to the initiative of individual educators. Most of the examples of courses from non-philosophical disciplines which try to include a critical thinking component are in the area of adult basic education (e.g. Krynowsky; Dean; Watson and Gutteridge). There are groups of educators in particular institutions who are meeting to discuss ways of initiating critical thinking across the curriculum, but little formal headway has been made. There has been a limited inclusion of critical thinking goals in professional development programs. Within the British Columbia Association for Critical Thinking Instruction and Research, there is a lively theoretical discussion, coupled with the examination of practical strategies, in the area of critical thinking across the curriculum.

**Existing Program
Models**

Attention is given below to some programs elsewhere in North America, at the system and institutional level, which might serve as possible models for developing critical thinking across the curriculum in British Columbia.

**1: Tandem Course
Model**

The model discussed under this heading is in place at Fiorello H. LaGuardia Community College, affiliated to the City University of New York (CUNY) in Long Island City, New York. The information upon which this description is based has been obtained from its Director of Creative and Critical Thinking Studies, John Chaffee.

The Tandem Course Model is so named because the method of extending critical thinking instruction beyond free-standing critical thinking courses is to pair the latter with specific-content courses across the disciplines. Students who enroll take a course in mathematics, English or social sciences, whose content and methods of instruction are closely coordinated with those of a critical thinking course which they take concurrently. The latter is called "Critical Thought Skills," and encompasses a wide range of creative and critical thinking abilities. It is interdisciplinary, and focuses on fundamental literacy, communication, problem-solving and reasoning skills. The CUNY

program has been evaluated positively in each of these areas by Garlie Forehend of the Educational Testing Service.

Some comments about the administrative aspects of the program should be made. The coordination of instruction required by the pairing is accomplished by weekly meetings of the two faculty members involved in each pairing, and weekly meetings of all of the faculty members involved in all the pairings accomplish the overall coordination. (There are at least 30 sections, with 600 students, in Critical Thought Skills each semester.) This amounts to a substantial investment of faculty time, but this investment appears to be justified by the results gained. The overall development and planning of the program has been supported by two sizeable grants (the second was for \$158,725 [U.S.]) from the National Endowment for the Humanities.

An approach similar to this has been tried in a limited way in British Columbia at Douglas College, but the instructors involved reported that there was insufficient time available in their schedules for successful coordination. The approach has therefore been abandoned for the time being. The experience at LaGuardia suggests that faculty time-release may be necessary to start such a program.

An assessment of the worth of the Tandem Course Model is dependent on an accurate picture of its goals. There is no doubt that it can work, as the final report of the granting authority demonstrates. However, it should be borne in mind that its goals are limited. If this is the only form of critical thinking instruction in place, there is only one course (aside from the specific critical thinking course) in which a student can expect to meet critical thinking instruction during a college career. It seems that at LaGuardia further efforts are being made to incorporate critical thinking components into most courses, and this is clearly required for an instructional program to qualify as critical thinking across the curriculum. As argued in the "Issues" section of this report, in this way students can acquire the necessary combination of training in transferable skills and exposure to discipline-specific nuances. In this way there will be the mutual reinforcement of the skills used in one course by those used in another, and hence the attitudinal developments essential to regarding critical thinking as a mode of living, not just a set of isolated skills.

The value of the Tandem Course model depends upon how broad an exposure to critical thinking techniques and attitudes can be attained by a student in the institution. In itself, the model does not provide for more than a single pairing in the experience of any particular student. It is more than possible that a by-product of the application of the Tandem Course Model is

the slowly-spreading sensitization to the goals and techniques of teaching for critical thinking within the institution.

II: Faculty Development Model

The model discussed under this heading has been used at the University of Wisconsin-Eau Claire. The information contained in this description has been supplied by Leonard Gibbs from the University's Department of Social Work. In this model, the attempt is to introduce critical thinking instruction by relying solely on professional development for faculty, without co-ordinated curriculum planning at the University level. Although a course in critical thinking is now taught, the faculty development program under consideration pre-dated (in fact, was a tool in bringing about) its entry into the curriculum.

The program consisted of a series of day-long workshops for faculty in critical thinking and its instruction, conducted by such well-known figures in the field as Neil Browne, Stuart Keeley, Robert Ennis and Michael Hakeen. There was a financial incentive for taking part in the program, and an evaluation coordinated by Leonard Gibbs. The hope was that faculty who participated would be able to increase the critical thinking component of their own courses, and so increase student achievement in this area.

This hope was not fulfilled when the evaluation was completed. Neither faculty nor their students performed better than control groups on standard tests of critical thinking ability. Although the workshop was successful in many ways, this particular aspect of failure is instructive. The authors of the evaluation point out financial constraints which made it difficult to accomplish a satisfactory study design, and a partial problem with attrition. Another possible explanation for the weakness of this program is that it may also have suffered from being an isolated attempt to do something which really requires a more comprehensive approach at a number of institutional levels.

A program which fulfills the requirements of comprehensiveness although in a slightly different context, is the Critical and Creative Thinking Program at the University of Massachusetts-Boston. This is a professional development Masters program for K-12 teachers, involving course work, a practicum and a thesis, and normally takes two to three years to complete when combined with employment in the school system. The success of the program is testament to the value of an in-depth approach, but it is unlikely that it would provide a practical model for the British Columbia college context.

The assessment of the Faculty Development Model is difficult on account of the paucity of data and the variety of models. Those discussed here seem to indicate that this is a desirable component in critical thinking across the curriculum provided that it is not viewed as the only solution (Kurfiss). It is

recommended that professional development be integrated with curriculum planning which emphasizes both critical thinking courses and critical thinking components across the disciplines.

III: Integrated Course Model

The example to be discussed under this heading is the General Education Program at Clayton State College, in Morrow, Georgia. The information upon which this description is based was provided by Blaine Carpenter, Professor of Biology.

The Program represents probably the most comprehensive treatment of critical thinking across the curriculum in the North American continent. Its introduction required a complete reorganization of the existing criteria by which courses within the institution were assessed and approved. It required the coordinated work of more than 70 faculty-members and a three-year FIPSE grant (of approximately \$100,000 per year) to cover time-release and other costs. It involved a complex integration of curriculum development, professional development, high-school liaison, and ongoing research and assessment. It appears to have been very successful, and has played a role in the promotion of the college from a two-year Junior College to a four-year State College.

The project to develop this program began by generating a set of desirable outcomes for the general education of students. These included the skills of Communication and Critical Thinking, articulated within the perspectives "aesthetic," "contemporary," "historical," "mathematical," "scientific" and "value." (A perspective was defined as a knowledge-based frame of reference within which one understands, interprets and evaluates what one encounters.) The skills were to be developed by across-curriculum instruction which promoted them within one or more of the perspectives mentioned. Courses were assessed and redesigned to accord with this model of their goals.

After the entire faculty body had been consulted, and some form of consensus reached about the desirable outcomes, an organizational structure was set up to coordinate the work of the project. A twenty-member General Education Council was responsible for overall planning and assessment, and eight subordinate Outcome Councils focussed on each of the skills and perspectives. The Outcome Councils also dealt with faculty liaison and development; the calendar was rearranged to provide for class-free days when workshops could be held. Substantial efforts have been made in the direction of high-school articulation, and different methods of accomplishing this have been tried.

One particular feature of the program is of special significance to this report. As originally designed, it omitted the use of specific free-standing courses in

critical thinking, opting instead for purely across-curriculum critical thinking instruction. The theoretical considerations discussed in the "Issues" section of this report predict that this approach would not be viable. Students would gain only limited familiarity with general reasoning skills, and as a result the element of self-consciousness about their own reasoning processes, so essential for successful development, would be lacking. This in fact was the experience at Clayton. It was found that students did not develop general reasoning skills fast enough to take advantage of the exposure to them in content-courses. On account of this, the program has been redesigned to include a requirement to take a critical thinking course. This change seems to have produced the required results.

This is one important lesson to be learned from the case of Clayton State College. Another is that careful and comprehensive planning, including articulation with other levels of the educational system, ongoing faculty consultation and development, as well as a significant evaluation and assessment component, is the key to success. The investment in terms of money and time appears to have paid off, and those involved report an increased level of faculty involvement and satisfaction in their teaching. It is an exemplary model for critical thinking across the curriculum.

The Integrated Course Model uses the "holistic" conception of critical thinking. It combines free-standing critical thinking courses with critical thinking approaches in content-courses. There is an ongoing integration of theoretical research, curriculum planning, pedagogical practice, professional development and program assessment. The mutual reinforcement of all of these factors is what makes this the most highly developed, comprehensive, and successful implementation of critical thinking across the curriculum.

IV: System-Level Realization of the Integrated Course Model

This section will close with a look at the California Community College system. The information used in this subsection has been supplied by Nancy Glock of the Chancellor's Office of the California Community Colleges. The California Community College system is a partially-centralized array of colleges. Curriculum planning is done at the institution, or, in some cases, at the district level, but all courses must be approved by the Chancellor's Office, the main focus of centralized planning. As a result of growing concern about the credibility of the two degrees offered by the system (Associate degrees in Arts and in Science), there has been a change in the regulations for course approval. Over the last decade in California there has been a great increase in remedial courses necessary to bring students up to "college level", but these courses were offered for degree credit. The new regulations distinguish degree-credit courses from a number of lesser levels, and only courses which satisfy stringent criteria of educational value and level qualify

for degree-credit status. Among these criteria, and given great prominence by the Chancellor's office, is promotion of critical thinking.

At the time of writing, all 120,000 courses offered by the system are thus being screened for critical thinking content. The screening is carried out at the college or district level, but the guidelines by which the screening is to take place are designed centrally in the Chancellor's Office. The Office also retains the right to audit procedures at the local level. This seems an appropriate balance between the need for a comprehensive approach to secure adherence and the need for local autonomy in the making of decisions which, it seems, emerged from concerns at the grassroots level in the first place.

The program adopted thus enables the integration at the local level of course content and techniques to achieve critical thinking outcomes.

There is a degree of articulation with the K-12 level, which is standardly evaluated every three years through the testing of the thinking abilities of its students. Elsewhere in the post-secondary sector, critical thinking is taught in free-standing courses in both the University of California and California State University systems. The greatest difficulty for the college system seems to arise in the area of faculty development as faculty have not participated widely in the workshops offered, although some changes have now started to occur.

In comparing the British Columbia and California Community College systems, it is necessary to point out that the main difference between them is the absence of a central course-approval mechanism in British Columbia. The establishment of such a mechanism is not recommended by this report (it is in any case outside its terms of reference). It is felt, however, that the coordination of the move towards critical thinking across the curriculum can be effected through presently existing articulation mechanisms provided these are backed up sufficiently in the areas of curriculum and instructional development support.

Conclusions

The overwhelming message obtained from the examination of models described above is that the successful attempts to teach thinking skills are those which are most comprehensive. While the personal initiative of individual instructors and provision of faculty development workshops are important, they are not enough. The successful programs, whether at the college or system level, involve a multiplicity of interrelated initiatives in curriculum planning, course design, faculty development, articulation with other levels, assessment and research. They have required care, discussion, testing, time and money. They have required a supportive environment in

which the activities of educators can be encouraged and co-ordinated. They have required commitment from all sectors of the educational community.

WRITING ACROSS THE CURRICULUM

Introduction

Traditionally, education has been synonymous with literacy. Since writing was the medium of intellectual culture, only the literate man or woman held the key which unlocked the garden of ideas. Before the advent of the electronic media, writing alone made possible the permanent recording of thought, and its continuing elaboration. The written language was, in turn, shaped by this historical function, becoming peculiarly able to express rational thought. Spoken dialects might be mutually incomprehensible, but the educated man or woman could expect to understand all written discourse in the language.

In this century, however, our school system has responded to new pressures. An industrial society demands that its schools fuel its factories with specialized technical knowledge. Knowledge has become compartmentalized as its diverging streams have carved out their own languages. Those literate in one such language are not necessarily literate in another. Instruction in writing, traditionally centred in English Departments, may appear irrelevant to a student whose future lies in quantum mechanics.

The proliferation of information, however, hastens its obsolescence. Schools and colleges now find themselves charged not only with the nurturing of knowledge, but of rationality itself. They must place less emphasis on the body of knowledge to be transmitted from teacher to student, and more emphasis on methodology, or the capacity to locate relevant information and make meaning from it. If methodology is to be mastered, it must be exercised by thinking, speaking, and writing.

At the same time, as disciplines begin to integrate perspectives from other disciplines, and the rigid boundaries between them begin to dissolve, the ability to synthesize and relate ideas becomes especially valued, and the need for reasoning ability and clear expression more urgent. Writing is particularly well suited to analytical and logical thinking: its linear order, its slow pace, its complex grammatical structures facilitate the careful articulation of ideas. Writers, more readily than speakers, may detach themselves from their concrete surroundings, pursue uninterrupted lines of thought, engage in abstract or speculative thinking. On the one hand, the absence of an immediate listener forces the writer to be scrupulously explicit. On the other, the fact that a reader may read the text many times frees the writer to be original.

Broadly, what is called for is a radical restructuring of the curriculum to foster thinking and writing abilities. The first step towards such a restructuring is the recognition that writing should occur in every classroom. Such a proposal is not new. Josephine Miles, chair of the Prose Improvement Committee at the University of California at Berkeley, wrote in 1958, "Learning a subject involves learning how to write about it. Teaching a subject involves teaching how to write about it" (qtd. in Russell 189). What is new, however, is the unprecedented burgeoning of writing across the curriculum programs over the past ten years, not only at small liberal arts colleges but also at large technological universities. The rapid dissemination of interest and enthusiasm has been such that it seems appropriate to talk about a writing across the curriculum movement. The movement promises much and has already achieved much; whether the spark can be sustained over the long haul will depend on the degree of continuing commitment shown by faculty and administrators.

The movement for writing across the curriculum draws its energy partly from the impulse to improve the intellectual life of the community and give students an education which will last them into the future, and partly from simple pragmatism. The call for improved literacy is a popular slogan, and can be supported by facts: "Recent research tells us that most engineers spend at least 25% of their time on the job writing — sometimes jotting down notes or writing brief memos and reports; at other times, composing full-blown reports or carefully articulated public documents" (Young and Fulwiler 109). Common sense suggests, and research now confirms, that the best way to learn to write is to write (Stallard; cited in Carroll 327). The more students practise writing for a wide range of purposes, the more confident and able they become. A stronger argument still, however, and offering more immediate advantages to the student, is based on the contention that writing is a means of learning. This will be the main theme of the outlined rationale that follows.

The notion of writing to learn is rooted in changing conceptions of the nature and function of writing. Prior to the 1960s, the dominant conception of academic writing tended to concentrate writing instruction in English Departments. Primary emphasis was given to the written product, and to the formal elegance and grammatical correctness which characterized the most polished products. Students were given instruction in the traditional modes of discourse (description, narration, and exposition), analyzing pieces by professional writers to determine the rules governing them, and then attempting to follow the rules in their own essays. Classroom teaching was prescriptive, and writing assignments in all courses were primarily a test of students' knowledge and writing skills. Students who lacked self-confidence and writing fluency were often caught in a vicious cycle of failure, learning to dread written assignments. Instructors in subject areas other than English naturally felt reluctant to teach writing thus defined.

To a large extent, this traditional conception of academic writing has been modified by developments within the field of composition itself. Composition research, based on the study of writers' actual behaviour, has led to a shift of attention from the product to the process of writing. Researchers have analyzed both the processes followed by individual writers and the social or communal process of making meaning. The dominant approach to writing now is experiential rather than theoretical. It suggests that we learn to write best by dealing with material we care about and by having a clear guiding purpose. The new perspective gives us reason to believe that writing can be more than a test of knowledge and skill, and that all instructors can teach writing in their fields.

The following two sections, "The Writing Mind" and "The Writing Community," will examine the individual and the social perspective respectively. They will also outline the rationale for writing across the curriculum that each offers.

The Writing Mind

The individual perspective on the writing process is based largely on the work of researchers such as Mina Shaughnessy, Sondra Perl, Linda Flower, and John R. Hayes, who have asked writers of varying experience to record their thoughts as they compose. Their findings suggest that writing is a continuous process of discovery. Ideas do not exist fully formed in the writer's head, to be caught in an outline and transferred onto paper. Rather, the germ of an idea grows under the stimulus of writing and is shaped by the mental discipline of composition. The vitality of the process means that it is not tidy: the process often loops back on itself as new ideas modify earlier

plans. Revision does not mean simple correction, but a re-seeing of the whole, perhaps in a new light. Writing, if genuine, is an act by which the mind encounters a subject. It is closely analogous to thinking and learning.

A seminal theorist of the writing across the curriculum movement is James Britton, whose study of developing writing abilities in London secondary school students appeared in 1975. Britton's key terms are the basic currency of the movement; in fact the phrase "writing across the curriculum" is his. "Expressive" language, according to Britton, is the natural wellspring of the writing process. It is language "close to the self" (Britton, Prospect 96), the language of casual speech, personal letters, and diaries. It is also the language of exploratory writing. The expressive writer does not have to worry about the audience's need for clarity and completeness. He is free to catch thought on the wing, recording questions, speculations, and tentative conclusions as they occur to him.

"Transactional" writing, on the other hand, is writing to communicate. It is conditioned and shaped by the need to convey a subject to an audience. It is public while expressive writing is private. "Transactional language is the medium of a verbal transaction, a means of getting something done through language, whether it be asking or giving information, instructing or persuading" (Britton, Prospect 124). Britton's third kind of writing, "poetic," aims not to get things done, but to make something through the medium of words. It is language used creatively, in stories, poems, or plays.

Formal academic writing, then, is transactional. But Britton's importance for writing across the curriculum movement stems from his hypothesis that **expressive writing is the matrix from which the other two kinds develop, and a wellspring of lively writing.** He argues that students who first explain a subject to themselves, in a relaxed and informal way, will write more thoughtful transactional papers later on. Thus journal entries, free writing, or free association on a given topic may become seedbeds for papers, because they allow students to establish a personal connection with the topic. Such activities encourage synthetic rather than analytic thinking; their spontaneity may release sudden flashes of images or the visualizing of new wholes.

If the aim of education is to deepen and broaden the learner's picture of the world, and to help her represent that picture in the symbolic terms of language, the teaching of writing must begin by setting up a working relationship between the writer's language and her experience (Britton, Prospect 110). As the learner's world picture broadens, her writing can become transactional. As it deepens, writing can become poetic. So expressive writing, according to Britton, is both a natural starting point and a

fertile resource. Writing so rooted will not be a dry rehearsal of second-hand facts.

The American scholar Linda Flower, whose research has investigated the cognitive process of writing, has developed the parallel concepts of "writer-based" and "reader-based" prose. Writer-based prose, according to Flower, is symptomatic of an immature or inexperienced writer, but also represents a useful stage through which the experienced writer may work. Writer-based prose shows no conceptual or analytic structure determined by the demands of the subject or needs of the reader. Instead, it is associative or narrative in pattern, following the order of the writer's thinking and failing to support or develop implicit ideas. In order to transform the writing into reader-based prose, the writer must step back from it, creating explicit logical connections and shaping the material into the structure that best satisfies the need to communicate.

Positively, however, writer-based prose offers the writer a "medium for thinking" (Flower, "Writer-Based" 27) unconstrained by the need for graceful style or clear organization. It can thus be a powerful means for generating ideas, exploring connections, and retrieving information from memory. Juggling the balls of content, organization, and style simultaneously may demand a dexterity beyond even an experienced writer. Flower's ideas, like Britton's, suggest a writing pedagogy based on multiple drafts, but also suggest that raw, untransformed expressive writing can be a means of learning.

The proposition that writing is a means of learning is the thesis of Janet Emig's influential essay "Writing as a Mode of Learning." Emig cites findings by psychologists and learning theorists that the higher cognitive functions develop most fully only with the support of verbal language (122). She then builds a case for the uniqueness of writing. Alone among the language activities (listening, talking, reading, and writing), writing engages brain, hand, and eye. Writing is a slow, artificial, and deliberate act, requiring effort and commitment. Writing creates an original construct which is graphically recorded, and thus available for immediate review (123). Written language is rich in words and syntax which indicate conceptual relationships. The connections the writer makes are his own, and denote his understanding of the material.

Emig's argument suggests that writing is too powerful a tool to be ignored in any classroom. Given a conception of learning as "engaged, committed, personal" (Emig 126), writing has a claim to be considered as "a central academic process" (127). Its value to the student as an active learner outweighs its value to the teacher as a means of assessing students' knowledge.

On this basis, exponents of writing across the curriculum have harnessed informal or expressive writing as a means of promoting the student's cognitive maturity. They also stress the value of expressive writing in discovering and generating ideas.

Theorists who advocate expressive writing as a means to increase student understanding see writing primarily as reasoning. They promote a kind of writing which is not emotive but rational, and expressive only in the sense that it follows the logic of the writer's thoughts. Such writing includes journals or learning logs in which the student may record observations (perhaps in the laboratory or on a field trip), draw conclusions, raise issues, or extend the implications of key concepts. For example, Knoblauch and Brannon advocate "writing that tests various possibilities of connection and coherence in an orderly, penetrating way; writing intended to be read by a supportive teacher whose role is not to evaluate but only to respond to it, raising questions about it in order to facilitate more writing, more connection-making" (470).

Thus the immediacy and open structure of the journal (together with the freedom from evaluation) encourage the writer to be exploratory. The instructor responds as a subject specialist rather than a writing instructor, conducting a dialogue with the writer by suggesting new problems and possibilities. At their most mundane (and most useful in certain content courses), journals may simply represent the student's effort to express complex concepts in his own words. At their most adventurous, they give the student a licence to be original, and a small part in the human enterprise of shaping perception through language.

A more practical argument is that careful writing is an intellectual discipline. The following statement, by a scientist, has strong commonsense appeal:

The power of writing as an aid in thinking is not often appreciated. Everyone knows that someone who writes successfully gets his thoughts completely in order before he publishes. But it is seldom pointed out that the very act of writing can help to clarify thinking. Put down woolly thoughts on paper, and their woolliness is immediately exposed. If students come to realize this, they will write willingly and at all stages of their work, instead of relegating "writing up" to the very end and regarding it as a dreadful chore that has very little to do with their "real" work. (Woodford 744)

Those who argue for the power of writing in promoting cognitive maturity frequently cite Jean Piaget's theory of intellectual development. Piaget holds that human beings pass through four distinct stages on their way to intellectual maturity. Overall, the movement is away from physical interaction with the immediate, concrete world, and towards the ability to

form concepts and ultimately abstract hypotheses about that world. The final stage ("formal operations") represents the flowering of mental capacities, including the abilities to solve problems, draw conclusions, and develop logical arguments. Research indicates that many entering college students appear to lack these abilities; for example, they have difficulty discerning causal relationships, discriminating between observations and inferences, and seeing analogies (Gere 2).

In order to remedy their students' cognitive deficiencies, instructors in content areas may design writing assignments to elicit specific thinking patterns. Students may be led through a sequence of assignments which build upwards from simple to complex thinking. They may, for example, be asked to record observations in field notes, then to order these observations in several categories, and finally to draw inferences from the observations. If they are to be effective, such sequences must accord with the students' level of cognitive maturity. In addition to teaching thinking skills, they "introduce students to the processes by which scholars formulate and investigate the questions of their disciplines" (Smith 461).

Many teachers of writing across the curriculum respond to the current view of the writing process also in their encouragement of multiple drafts. The writing process, as reflected in tapes of writers "thinking aloud" as they compose, is complex and recursive. The flow of composing resembles a stream eddying back on itself as it picks up and rechannels its own energy. Thus writers continuously reread, reconsider, and reformulate as they push the process ahead (Perl 365). Early drafts tend to be expressive, since the writer's ear is attuned to her own intuitive sense of the topic, but later drafts are progressively honed by the writer's awareness of her audience.

A premature sense of audience, however, may be inhibiting. Sondra Perl argues that writers who attend only to their sense of audience "focus on what they think others want them to write rather than looking to see what it is they want to write" (368). In the extreme case, writers may reduce their sense of audience to an obsessive concern for the appearance or mechanical correctness of the finished paper. So teachers who "base their instruction on warnings about the numerous booby traps hidden in Standard Written English" may well receive lifeless papers (Maimon 365).

This view of the process, then, supports teaching techniques which encourage students to shape their writing and not rush it to completion. It opposes techniques based on the notion that the process can be neatly divided into a series of discrete stages which match for everyone (prewriting, writing, and revision). The impracticality of standardized "blueprints" for writing becomes a further argument for using writing in all courses as a means of making students better writers. All writers need a sense of

purpose, and this may be best achieved by putting content at the core of the writing process.

A sense of purpose may be fostered, too, if written assignments are not always addressed to the teacher as examiner, and if grading criteria reflect the purpose of the assignment rather than conformity with a set of rules. Such practices are bolstered by Flower and Hayes' findings that the least secure student writers tend to focus on the mechanical elements of writing, giving their primary attention to spelling and punctuation at the expense of substantive elements. Conversely, experienced writers know that they may safely postpone some of the finer considerations while they get their ideas down (Soter 429).

The holistic view of composing as a "messy process which leads to clarity" (Shaughnessy 79) does not imply that writing cannot be taught. In fact, students can be offered specific strategies to use as they shape their material, many of which are thinking strategies appropriately taught in the subject area classroom. When the process of academic writing is analyzed from a cognitive point of view, it is seen to demand many complex mental operations, including "the ability to select appropriate and relevant information, the ability to embed information where relevant, the ability to see the need for extending and exemplifying ideas, the ability to know where digressiveness can serve useful functions, the ability to know at which point the conveying of information has been completed, and the ability to organize ideas according to conventionally accepted hierarchies" (Soter 426).

Research carried out in several fields, in which mathematicians, physicists, chess players, writers, and musicians were asked to think aloud on tape as they solved problems, has concluded that experts in a field can draw on an arsenal of established thinking strategies, while novices proceed by trial and error (Fulwiler and Young 33). Specifically, Flower and Hayes' study of the cognitive processes of writing has identified "problem-solving strategies" successfully used by experienced writers. They argue that students can be taught to apply an array of thinking skills as required by the demands of the writing task. These strategies offer ways of defining goals, generating ideas, testing relationships, and pulling ideas together in an analytic framework (Flower, "Problem-Solving" 451). A useful strategy for seeing relationships, for example, may be the construction of a tree diagram showing the hierarchy of connections between main and subordinate ideas (Fulwiler and Young 39).

Such an approach clearly lends itself to the teaching of writing in a subject classroom, where the instructor can demonstrate the thinking strategies important in the discipline and have students apply them in writing. In the sciences, integrating writing with visual techniques such as flow charts and

equations may also help students verbalize subject matter and reinforce their understanding of it (Fulwiler and Young 40).

For the student, then, writing across the curriculum offers a means of articulating and exploring subject matter. Writing becomes a serious enterprise, with a purpose that transcends the earning of a grade. An incidental but cumulative effect will be an increasing sophistication as a writer. That sophistication will be based on active experience, not precepts. At first hand, the student will sense "the pressure of experience on language and the centrality of that process to the work that brings ideas forth" (Hamilton 796). Writing will be learned from the centre outwards.

The Writing Community

The second approach to writing that has helped shape the writing across the curriculum movement is based on the premise that writing is a social act. Communication presupposes community, and to talk the same language is to feel kinship. It is well known that not all conventions of language cross disciplinary lines: physics instructors and English teachers do not give the same advice about personal pronouns and passive verbs. Accordingly, students cannot readily transfer all that they learn about style in a composition class to their writing in other disciplines. These conventions are not superficial, however: they reflect a discipline's understanding of itself. Thinking and writing in a specialized discipline may well be inseparable.

Learning to write in a given field, then, may be seen not only as the acquisition of a set of rules, but as the initiation into a culture. "Our teaching of writing should present the mechanical rules and skills against a broader understanding of why and how to adjust or violate the rules, of the social implications of the roles a writer casts for himself and for the reader, and of the ethical repercussions of one's words" (Miller 617). Correspondingly, to write a lab report in physics or a formal argument in philosophy is to be active in that field of enquiry, and to reflect on one's style of writing is to reflect on one's professional stance in society. In many cases, writing in the subject areas is a prototype of writing in professional life.

Such highly developed and meaningful languages are clearly best taught by a native speaker, a trained specialist who belongs to the community. According to the authors of *The New Rhetoric*, the "terms used, their meaning, their definition, can only be understood in the context of the habits, ways of thought, methods, external circumstances, and traditions known to the users of the terms" (Bizzell 769). Taught in this way, specialized writing will be a natural extension of the work and talk that go on in the classroom. It will be demystified for students.

Much has been written about the cultural and linguistic backgrounds of students entering college, and their effect on achievement. Many students inhabit a language world rich in the vocabulary of personal experience, but poor in the vocabulary of abstract thought. The writing done by these students may ring true with a fresh, authentic voice, but academic prose remains a foreign language to them. A writing pedagogy which does not address this issue, drawing them into the community by exposing its workings to them, will keep them permanent exiles from academe and the professions.

One powerful technique to help build a scholarly community in the classroom is that of collaboration. This offers a social context in which students may converse in the language of the subject. Collaboration recognizes that the search for truth is a shared enterprise. It may ease the transition from the student's own world to the academic world, helping him to feel comfortable with the terminology. Also, it may ease the loneliness felt by many student writers.

Collaborative learning takes many forms in writing across the curriculum programs. Instructors may collaborate with students, making positive suggestions on early drafts of their writing rather than grading them. Students may collaborate with one another at many points in the writing process. They may brainstorm collectively for ideas, respond to one another's first drafts, or form editing groups. The system of peer tutoring successfully established at many institutions is a powerful form of collaboration. The tutor mediates between the student and the institution, bringing the force of peer influence into the service of learning. The student learns actively: through dialogue with the peer tutor, she learns to argue, to analyze, to develop ideas (Hawkins 67). Finally, the writing centres which often serve as focal points for writing across the curriculum programs are based on collaboration between staff member and student: the staff member serves as a responsive audience who asks questions, makes suggestions, but does not evaluate.

The notion of the language community derives from the pluralism of contemporary linguistics, its acceptance of the idea that there is no one standard language but many, all with their own norms and conventions. The application of this broad idea to writing in scientific fields has been influenced by current epistemology, particularly the thinking of Thomas Kuhn in The Structure of Scientific Revolutions. This thinking rejects the "windowpane" theory of language which holds that words can be transparent, allowing us to approach reality directly.

Briefly summarized, [the new epistemology] holds that whatever we know of reality is created by individual action and by communal assent. Reality cannot be separated from our knowledge of it;

knowledge cannot be separated from the knower; the knower cannot be separated from a community. Facts do not exist independently, waiting to be found and collected and systematized; facts are human constructions which presuppose theories. . . . Science, then, is not concerned directly with material things, but with these human constructions, with symbols and arguments. Scientific observation relies on tacit conceptual theories. . . . Science is a communal enterprise. (Miller 615)

According to Kuhn, such a community is bound together by a shared language (Bizzell 767). To understand the language is to understand the kinds of evidence and arguments the community finds convincing. Standards of truth are determined by the community.

By implication, then, rhetoric and science are not diametrically opposed. The 1970s and 80s have seen a resurgence of interest in rhetoric, based on the premise that truth for human beings emerges from the dialectic between writers, readers, reality, and language. (By contrast, the traditional call for objectivity and factuality in expository writing posits an unchanging reality which exists independently of the writer, and which the words must attempt to mirror.) According to theorists of the New Rhetoric like Richard Weaver and Edward P.J. Corbett, writing cannot be separated from its context, and audience and intention affect every stage of the creative process (Hairston 8).

Teachers of writing across the curriculum use many of the methods advocated by the New Rhetoric. Formal assignments are set in a full rhetorical context, the nature of the audience and the role of the writer being specified. The ability to conceive of a reader's needs and interests implies an ability to see the world from a perspective other than one's own. Assignments may be sequenced, being addressed at first to close, familiar audiences, and later to increasingly remote or specialized audiences, in order to foster students' cognitive maturity (Fulwiler and Young 59). Clearly, writing for an audience is vitally important for business students, who must learn to write purposeful, direct reports which managing directors will want to read (Rose 273). But academic students, too, may develop their sense of audience by practising the everyday writing forms of their future professional fields: grant proposals, political briefs, memos to colleagues, or feasibility studies.

The ideal of a scholarly community, with students as active participants, has also provided an impulse for the integration of reading and writing. One writer sees the body of published work in a field as a continuing conversation, in which students may learn to share:

When we ask students to write purely from their selves, we may tap only those prior conversations they are still engaged in and so limit the extent and variety of their reading and writing. We can use reading to present new conversational opportunities that draw students into wider public, professional, and academic communities. (Bazerman 661)

Writing assignments which ask students to interact with reading materials may draw them into such "conversations." If, in addition to writing summaries and paraphrases of their reading, they write informal responses and more formal evaluative reviews, they will be entering into a dialectical relationship with the published writers. Many teachers of writing across the curriculum ask students to keep reading journals as a continuous record of their active reading. As the students assimilate the material, their eyes and ears absorb the academic prose. This then predisposes them to become good writers in the discipline.

How Writing Promotes Learning

Anecdotal reports from many students and teachers suggest that writing across the curriculum has been highly effective in improving student learning, writing, and overall morale. (Lois Barry's Busy Professor's Guide to Writing across the Curriculum contains many pages of testimonials.) However, few studies have investigated the effects of writing on learning. The studies which have been done indicate that the relationship of writing to learning is complex, and varies with the writing task. In 1987, Judith A. Langer and Arthur N. Applebee published the results of their three-year study of the use of writing assignments in two San Francisco high schools. Although carried out at the high school level, this study is pertinent because it examines and compares the effect on learning of traditional assignments used to consolidate learned material (note taking and study questions) and assignments used to reformulate and extend knowledge.

Broadly, Langer and Applebee conclude that writing about unfamiliar material does indeed help students to learn. Students who write about course material retain more than students who do not. The effects of writing on learning, however, are highly specific: students are much more likely to recall information and ideas they have written about than other material in the text under study. The more students have to manipulate ideas as they work them into the structure of their own writing, the more likely they are to remember the ideas. Accordingly, material used in an analytic essay is retained best, followed by material used in summary writing and material used in answers to comprehension questions (127).

Langer and Applebee's initial small-scale study provides some insight into the relationship between writing task and thinking patterns. Six high school juniors were asked to think aloud as they worked through three study tasks requiring writing: answering study questions, taking notes, and writing an analytic essay. The resulting tapes were analyzed for the kinds of reasoning they reflected. Students answering study questions engaged in the least complex thinking, limiting their attention to restatement of the question and location of the information that answered the question (100). Students taking notes paid attention to the content of the entire passage, but spent little time considering the relationships among the ideas or integrating the information into larger units. Students writing an essay engaged in the most complex thinking, paying more attention to the global sense of the passage, and forming and validating hypotheses about it.

Langer and Applebee's two subsequent, larger-scale studies serve to balance this picture, and indicate that different kinds of writing fulfil different instructional purposes. Students read a passage and were assigned a study task; their understanding of the material was then tested by standardized measures designed to assess the breadth and depth of their learning. These tests indicated that students who had taken notes had retained a broader range of material than those who had written essays. However, students writing essays demonstrated greater conceptual grasp of a narrower range of material. At a further test administered four weeks later, the essay writing group also showed the least decline in knowledge about the topic (110).

These studies indicate, then, that activities which ask students to work with an entire text (note taking and summarizing) may best help students to review a large body of information. Conversely, activities which focus attention on specific material within a text may lead to a better understanding of concepts and relationships (Langer 131).

Classroom activities, as Langer and Applebee point out, are shaped by their purposes. If an instructor perceives her main job as imparting a broad base of information, writing will be useful as far as it helps students to consolidate information. If an instructor's key objective is to have students work with concepts, relevant writing activities will ask students to formulate, test, apply, and extend ideas. If an instructor accepts the validity of integrating new knowledge with prior experience, writing activities may profitably ask students to draw on their existing knowledge and relate it to the new material. Finally, if an instructor believes that knowledge may be enriched by empathetic understanding, students may be asked to write about new subject matter by drawing on their imagination.

A study of the writing across the curriculum program at Michigan Technological University has also yielded encouraging findings about writing

and learning. After examining the use of journal writing in mathematics, researchers tentatively concluded that students who "translate" math concepts into language may learn by thinking about those concepts in non-traditional ways. Although statistical studies failed to prove the usefulness of journals conclusively, analysis of the journals themselves for evidence of thinking skills showed that students had used them to compose practical definitions of mathematical terms in their own words, evaluate the usefulness of course material in terms of their own experience, devise strategies for approaching problems in analytic geometry and calculus, and discover solutions to problems (Young and Fulwiler 198). The last function is interesting, since the thinking that sparked discovery apparently occurred during writing, suggesting that the journals had a learning value beyond the simple consolidation of knowledge.

A different kind of learning, empathetic understanding, may be fostered by poetic writing. Students in a psychology class included in the MTU study were asked to write a short story and a poem in which they put themselves in the place of a schizophrenic person, prior to writing a transactional essay about schizophrenia. Although the value of the assignments in enriching the contents of the transactional essay was not proved by a controlled study, the responses of students indicated that they felt they had begun to understand the subject from the inside. This kind of learning in a social science or humanities course seems to accord with the understanding described by Michael Polanyi in *Knowing and Being*: "Our understanding of living beings involves at all levels a measure of indwelling; our interest in life is always convivial" (qtd. in Britton, *Prospect* 128).

Two further studies at MTU provide some evidence that writing across the curriculum improves student writing. Students in a section of a civil engineering course used journals regularly, to comment on course material and learn work in progress. In comparison with a control section, the students who kept journals "produced final reports on design projects that were generally more coherent, organized, and complete than were the reports of the students in the control section" (Young and Fulwiler 190). A second controlled study examined lab reports written by biology students who had been shown models of writing in the discipline and used peer critiques as they developed their drafts. These students' finished reports were superior in both organization and content to those of students in a control section (Young and Fulwiler 167).

The Instructor's Response to Writing

If writing is seen as a means of learning, the instructor's response should be an aid to learning. Response, then, should be separated from evaluation, which is a measure of learning. Instructors may usefully react to their students' writing as mentors, guides, interested readers — roles which may be played by the subject specialist as readily as by the writing instructor.

This view of the instructor's response has two corollaries. First, not all written assignments should be graded. While grading encourages careful, full development of ideas, it may well discourage the spirit of discovery in writing. Students submitting an essay for a grade are more likely to seek the safety of a formula pattern, and to address their writing tacitly to the instructor as examiner. Langer and Applebee, for example, found that students tended to treat a graded assignment as a display of knowledge. Rather than using the assignment to extend their understanding of the subject, they concentrated on giving a polished performance (71). Such performances may well be pedestrian. If they are ever to take wing and fly, students must be allowed to flutter and fall. We all learn from partial failure, when our reach exceeds our grasp, and if the threat of grading is removed such falls may be preludes to success.

As they learn through writing, students need to be sustained by a response which affirms independent thinking, and elicits further development and articulation of ideas. Such a response encourages active learning. In particular, if course journals or reading logs are to benefit students or instructors, it is as important for both groups to know what students do not understand, as what they do understand.

The second corollary concerns the timing of the response. In order to foster good writing as well as effective learning, response to major writing assignments should begin early during the writing process. Current research, including a 1987 study of the response to student writing commissioned by the National Council of Teachers of English, confirms this idea. Early response (verbal or written comments on drafts or plans) is perceived by successful teachers as more helpful than response to the final draft (Freedman 157). In a study comparing the writing of students who received comments on their final drafts but did not revise, and students who received comments and then revised their essays, the students who revised showed significantly more improvement (Buxton; cited in Ziv 364). Finally, teachers who understand the writing process can exert a potent influence on the development of their students' writing ability. After a group of teachers attended a summer institute on the writing process sponsored by the New

Jersey Writing Project, their students showed significant gains in writing performance (Carroll 325).

Admittedly, the participants in the studies summarized above were English teachers and students in English classes. However, it seems reasonable to assume that the results could be duplicated in other fields. Instructors learn about the writing process by writing themselves, and by sharing their writing. Thus, presumably, they develop fellow feeling with their students, and become more willing to interact with them. The instructor may respond as an interested reader, asking questions, recording reactions, or requesting clarification. She may also respond as a subject specialist, encouraging more critical or more disciplined thinking. Such responses enable the student to gauge his success as a writer, and to develop further resources. In neither case does the instructor do the writing for the student.

Although research on the response to writing in fields other than English remains to be done, one may tentatively conclude that the most helpful responses are those which the subject specialist is best qualified to give. As far as stylistic matters are concerned, the goals of good writing are probably not served by meticulous marking of every error in an error-strewn paper (Hairston 5). Correcting one or two pages and having the student edit the rest for himself may well be more effective, together with comments that summarize the main strengths and weaknesses of the paper.

Evaluation itself needs further investigation. Criteria of good writing need to be developed for every field, rather than imposed from a prescriptive model of good English (Young and Fulwiler 128). Such criteria will be based partly on the conventions of discourse that govern writing in the field, and partly on the rules of evidence that govern effective argument in that discipline. Agreement needs to be reached (and conveyed to students) about the kind of writing error which seriously distorts meaning and the kind which merely blemishes it.

In the long term, the student's values about writing will be shaped by an instructor's response to his writing, whether or not those values are explicitly linked to a grading system. The instructor's concerns about style, organization, grammar or content will determine the student's attitudes. Collegial exchange of ideas about writing may help instructors articulate the values implicit in their responses. Although they may not (and probably should not) yield a consensus, such discussions may be a first step in building a community of understanding about the importance of writing in the classroom.

The Implementation of Writing Across the Curriculum

Successful programs of writing across the curriculum require, initially, knowledge and interest on the part of the faculty. Their continued operation requires carefully designed support which answers the needs of both faculty and students. Finally, the pattern of organization must be appropriate to the needs of the institution.

Most programs are initiated by faculty workshops, offered by writing specialists. Their content includes information about the writing process and the use of writing in courses on any subject. Participants explore ways to design good assignments, to give appropriate directions to students, to evaluate writing, and especially to use writing to help students learn.

The major premise supporting these workshops is that individual faculty members are the best agents of change in an educational community; changes in their attitudes will filter down to students. The workshops, like all good writing instruction, are experiential in their methods. Instructors work through a series of writing activities so that they may discover for themselves the value of writing in their classes. Discussion of theory follows a pattern of enquiry, problems and questions about writing being posed for group solution. Practical help is offered in the form of a range of suggested strategies and assignments which participants may choose to adapt for their classes.

Because they write themselves, workshop participants who rarely write become more comfortable writing, and develop empathy for student writers (Fulwiler 122). A study of attitude change after one such workshop found that a significantly larger number of participants were prepared to accept responsibility for teaching students to write than at the beginning of the workshop (Weiss and Peich 40). The workshops are successful, too, in raising faculty consciousness about writing, and in promoting collegiality by providing a focussed time for intellectual and social interaction across disciplinary lines (Fulwiler 122).

Some faculty workshops are offered over several days in the summer, in a relaxed, retreat-like setting. Faculty participation is voluntary. Such workshops appear to be successful in generating enthusiasm, but without follow-up activities their initiative might well founder. In fact, successful summer workshops are often supplemented by regular meetings through the academic year, or by the publication of a newsletter.

An alternative workshop pattern is one in which faculty are given a section of release time to attend weekly seminars over one academic semester (Raimes 797-801). Although this pattern lacks the intensity of the summer institute, it

has the virtue of closeness to the classroom: ideas suggested in the seminar can be immediately tested in the classroom, and classroom experience can be applied in the seminar.

Once faculty have decided to include more writing in their courses, they need an assurance of continuing support. This may either aid them indirectly, by helping their students, or directly, by helping them design and use written assignments.

One of the best established forms of support for writing across the curriculum is the writing centre or essay tutoring centre. Writing centres offer individual help to students working on writing assignments, usually on a drop-in basis. Students consult with faculty members or peer tutors, who help them articulate their ideas and develop a mature style. Writing centres aim to produce better writers rather than polished final drafts. They do not offer a proofreading service (although they may help students deal with grammatical problems evident in earlier written work) but expect students to take an active part in revision.

Writing centres may also offer periodic workshops for students, on such topics as writing essay examinations. At the invitation of an instructor, writing centre staff may also visit a class and give a guest lecture on a specialized topic like documentation.

In addition, writing centres may operate as a consulting service to faculty. They may advise on the design of assignments and handouts, the development of evaluation criteria, and the assessment of an assignment's effectiveness. Help may be given individually or through periodic workshops on specific teaching problems or strategies. Writing centres for faculty may also house resource material for the teaching of writing.

Such consultation is valuable because it responds directly to an individual's needs, goals, and fears, providing targeted guidance and suggestions. Also, consultation continues throughout the semester as the instructor tries out ideas and discovers how they work in class.

Another way to increase the amount of student writing while mitigating its effect on instructors' workload is through peer tutoring. Senior students with a good writing record are trained to work collaboratively with other students, either in class or in a writing centre. Alternatively, peer tutors edit first drafts of papers; the instructor then deals with content alone. In some cases, peer tutors (who may be called Writing Fellows) are appointed to work directly with the classes of instructors who do not wish to teach writing.

Such a system clearly offers incentives and benefits to tutors as well as their students, particularly if the relationship is based on collaboration. Tutor and student can pool their resources, the tutor bringing his knowledge of written

language, and the student bringing his knowledge of the subject (Bruffee 10). Tutors must, of course, be adequately trained and paid. Some colleges offer a special section of English Composition as a peer tutoring course. Students who score well on a placement test are invited to enrol, and those who complete the course satisfactorily can become paid tutors.

Programs for writing across the curriculum may be implemented in a variety of ways. In the most global, least formal pattern, instructors in all disciplines are encouraged to have their students write regularly. A college-wide policy about the importance of writing may be formulated and published in the college calendar. Such programs depend on instructors' continuing energy and commitment; they are probably the least likely to succeed in large universities where disciplinary barriers are difficult to surmount and pressure to publish is high. However, such programs may well flourish in the atmosphere of a smaller college.

A second pattern is based on designated Writing-Intensive courses (often labelled "W" courses) with extra written components. The student-instructor ratio may be reduced for these courses, allowing the instructor added time for reading papers and conferring with students. In these courses, some assignments are ungraded, some writing is done in class, the term paper is preceded by preliminary assignments and may be revised, and the instructor spends at least one class explaining how to write a paper in the subject.

For those who believe writing is essential to all learning, this pattern has a major weakness: the designation of only some courses as "writing-intensive" signals to students that writing is important in some courses but does not matter in others. However, some colleges which follow this system are ensuring that all students take some writing-intensive courses by building a specific number into graduation requirements. For example, students may have to take two "W" courses, preferably in their major fields, after completing one semester of composition. At the end of their program, they may take another semester of composition in which writing assignments will be related to their specific fields.

A third organizational pattern is the pairing of a composition course with a subject course (one in psychology, for example). Students enrol in both courses and the instructors team-teach, collaborating on assignments. Thus the assignments in the composition course are directly connected to the subject course.

A variant on this pattern is the "course cluster" in which three or four faculty members work together in an interdisciplinary course cluster. Such a program may aim to improve students' overall writing ability as well as teach them to think and write in the special methods of the disciplines.

Existing Writing across the Curriculum Programs

In "Writing across the Curriculum at Community Colleges," Stout and Magnotto discuss the results of a survey sent to U.S. and Canadian colleges on the mailing list of the American Association of Community and Junior Colleges. The survey was designed to investigate the present state of writing across the curriculum in community colleges and it revealed a wide range of longevity, funding, and organization. A few programs started before 1979, many began in the 80s, and some colleges are just beginning to consider implementing programs.

Most organizational patterns are college based, but two are system-wide, one in Minnesota and the other in Maricopa, Arizona. They are typically directed by a faculty member, although a few are managed by administrators. Release time for faculty writing across the curriculum directors ranges from less than one course equivalent to full-time reassignment. Multi-discipline writing across the curriculum committees are common.

One of the most solidly established writing across the curriculum programs in North America is at Michigan Technological University and grew from a series of faculty workshops designed by Toby Fulwiler and first offered in 1977. This program is of particular interest, since it was studied over several years by a team of researchers who evaluated its impact on the life of the university (Young and Fulwiler 1). While the experience of one institution cannot necessarily be generalized to others, the MTU study, published in 1986, is a useful source of information about the translation of theory into practice.

Several surveys of faculty attitudes towards writing, carried out immediately before and after faculty workshops over a four-year period, concluded that the workshops had at least created short-term changes in attitude, and greater awareness of the usefulness of writing (Young and Fulwiler 65). A subsequent study demonstrated that a large number of faculty had made changes and felt that their teaching of writing had improved (Young and Fulwiler 82). The pattern of these changes, however, suggested that two significant factors influenced the effect of faculty workshops: academic discipline and class size.

Most MTU students graduate in engineering, but the university also offers courses in the social sciences, the humanities, and other disciplines. Teaching methods which could be used to improve traditional writing assignments were picked up roughly equally by faculty in engineering, social sciences, humanities, and other disciplines. These included specifying an audience for writing, peer critiquing, conferring with students, and assigning

multiple drafts. But the more innovative methods associated with writing to learn were adopted least by engineers and most by composition teachers. These included assigning several short papers instead of one long one, sharing writing in class, brainstorming, journal writing, free writing, and ungraded writing (Young and Fulwiler 79). As the researchers point out, however, one reason for the selective effect of the workshops may have been the lack of follow-up activities, which are especially necessary for faculty not ordinarily exposed to ideas about writing (Young and Fulwiler 82).

In many institutions, the factor of class size may run in tandem with the factor of discipline. Not only do instructors in scientific and technical fields have to cover much course material in a limited time; they also frequently have to teach large classes. The same MTU study showed that in classes of twenty or fewer, regardless of discipline, the adoption of innovative methods as reported by instructors was roughly the same (Young and Fulwiler 75). These findings suggest that planners of faculty workshops should emphasize writing activities which enhance learning without consuming hours of class time or hours of the instructor's time.

Another strong writing across the curriculum program in the United States is Writing and Reading in the Technologies (WRIT) at Queensborough Community College in New York. This began in 1982 in vocational and technical programs, but has now spread to the liberal arts section of the college. WRIT emphasizes writing to learn through journals and microthemes (miniature essays with thesis and key supporting points). WRIT provides faculty with several workshops a year and is staffed with a director, an assistant director, secretarial help and department coordinators.

Writing across the curriculum programs are well supported by post-secondary institutions in Washington State and appear to be closely linked with the interdisciplinary teaching which is growing throughout the state. The University of Puget Sound offers writing intensive courses, and its Writing Centre supports writing in all disciplines, providing individual tutorial help as well as in-class or special subject workshops. Writing Centre faculty also serve as consultants to colleagues in all departments, many of whom meet at writing colloquia. The university rewards student writing through the Hearst Writing Prize. Western Washington University supports a successful Writing Fellows program as well as the University Writing Services. Washington State University and Evergreen College have both developed interdisciplinary and critical thinking programs.

In Canada, a unique across-the-curriculum program closely allied in philosophy to the tenets of James Britton has been developed at Dawson College in Montreal. Named Literacy Across the Curriculum (LAC), it aims to help teachers improve students' thinking ability and communicative

competence by placing greater emphasis on language in the classroom. As the first funded LAC program in Quebec and one of the few in Canada, it has grown since 1984 into a centre of faculty development for the English secondary and post-secondary system in the province, and a liaison centre with the French sector. The program is not focussed exclusively on writing, but is built on the premise that all language modes are interconnected and tied to learning. Literacy in the schools is not regarded as a separate issue from literacy in the community. The activities of Literacy Across the Curriculum include these:

- Publication five times a year of a faculty bulletin combining recent literacy theory with practical applications.
- Organization of workshops and seminars for teachers.
- Initiation of research and pilot projects.
- Development of liaison with high schools, universities, and industry.
- Sponsorship of projects to heighten student awareness of the importance of language in society.

Another Canadian writing across the curriculum program is at York University's Atkinson College. Named the Atkinson College Writing Programs, it aims to improve the quality of student writing in all disciplines by providing writing instruction and assistance in various formats. The goal is to ensure, as far as possible, that all students receive some instruction on the writing of academic papers so that the form in which they present their work will not hinder their expression. The program seeks to devise instructional situations appropriate to the various departments and to show faculty how they may improve student writing in their courses. Writing Programs integrates several components: interdisciplinary courses, an essay tutoring centre, and consultation to faculty.

The University of Winnipeg Writing Program developed from a curriculum review process in which some faculty members contended that fully developed cognitive, analytic, and expressive skills do not always evolve from education in the established curriculum. Convinced that expressive competence and self-confidence are central to active participation in the intellectual life of the university and society, faculty aimed for a writing program which would develop these attributes. It should not confuse development with remediation, but should accommodate the best student writers. To provide sufficient exercise of newly developed skills, the program was to be universal. The Writing Program, housed in the English Department, has two major components: first-year writing courses and writing-intensive courses. Students must successfully complete a first-year writing requirement before they can enrol for an eleventh full course. After

their first-year writing course, students take the equivalent of two and a half courses designated as writing-intensive. Every discipline in the university offers writing-intensive courses (Besner 6-10).

Here in British Columbia, some writing support programs are already in place. Six colleges have peer tutoring programs and nine have developed writing centres. However, if they are to offer advice to faculty on such specialized matters as sequencing assignments to meet cognitive goals, the mandates and resources of existing writing centres will have to be considerably expanded.

Fraser Valley College, with help from a Locally Initiated Curriculum Development Grant, is developing a writing across the curriculum program coordinated by the Communications and English Departments and involving a core group of interested faculty. Its goal is to create a structure which reinforces what is learned in writing courses with developmentally structured writing in all disciplines. In addition, it aims to enhance students' critical thinking abilities and understanding of course material.

Conclusions

Successful writing across the curriculum programs appear to be based on both faculty enthusiasm and administrative support. As Langer and Applebee write, "Institutional change does not take place when it is in conflict with institutional values" (147). Administrative support must take the tangible form of release time and guarantees of reasonable class size; large classes work against the concept of writing to learn. Ultimately, the value of writing across the curriculum must be recognized by provincial articulation committees and built into the criteria by which courses are articulated for transfer and credit. Publicly stated institutional policies about the amount of writing normally expected in courses would be a useful starting point.

Successful programs of writing across the curriculum appear to benefit students by helping them learn more effectively and improve their writing ability at the same time. Also, they often benefit institutions by bridging gaps between departments and disciplines. By exploring the academic uses of language in interdisciplinary seminars, faculty members may strengthen their sense of their own discipline while perceiving the relationships between disciplines. At the same time, discussion of methods may lead to the discovery of shared concerns. Among instructors as well as students, then, writing across the curriculum can foster community and collaboration.



RESULTS OF WRITING, READING AND THINKING SURVEY OF BRITISH COLUMBIA COLLEGES AND INSTITUTES MARCH, 1988

To find out what was happening in British Columbia's colleges and institutes regarding discipline-based instruction of reading, critical thinking, and writing, a questionnaire was mailed to administrators responsible for program areas. The administrators were asked to distribute these among instructors who may be integrating the teaching of writing, reading, or thinking skills within their curriculum (see Appendices B, C, D).

Fifteen institutions responded with a total of thirty-eight sets of completed responses. The following report is a simple compilation of all individual responses. It is not meant to be representative of each institution as a whole, neither is it an exhaustive list of reading, writing, and critical thinking instruction across the curriculum within the province.

British Columbia Institute of Technology

BCIT has courses in Technology Education for secondary Industrial Education teachers/student teachers which feature both creative thinking and problem-solving techniques. These projects span Design, Production and Marketing areas. They have also made informal attempts to introduce critical thinking as a component in teaching across the curriculum.

Regular meetings and discussions are held between technology programs and Communication faculty to broaden approaches to teaching writing skills.

In addition, a Remedial Writing Centre with a peer-tutoring component is available to students in all programs.

Camosun College

Critical thinking, creative thinking and problem-solving techniques are all components of a credit course on Entrepreneurship in the Business Program.

Informal attempts have been made to introduce critical thinking in the Health and Human Services curriculum, Department of Psychology. Ways to improve student learning through less traditional approaches to assigning and evaluating writing and reading assignments across the curriculum are under discussion. The English Assessment Committee, which includes representatives from many areas, has accepted the principle that the best measure of English ability is a writing sample (essay). It is moving towards establishing this principle in all programs in the college, including major career programs like Nursing. A Writing Centre on campus is very popular with students. Professional development seminars on improving learning through writing and reading are conducted.

Capilano College

Philosophy courses focus on critical thinking, informal logic, creative thinking and problem-solving techniques.

An English Writing Centre for students is available. One section release has been provided for development. Professional development seminars on improving learning through writing and collaborative learning have been held.

Douglas College

An Effective Thinking course includes both informal logic and problem-solving techniques.

In an informal way, analytical argument skills are presented in English 130, which is a writing-intensive course with increased writing expectations. Cooperative learning is emphasized.

Diana Wegner and Janet Giltrow were awarded an ACCC Innovations in Teaching Award in 1987 for their work "The Community/College Connection: Helping Students Write for the Real World."

East Kootenay Community College

Informal logic is a component of Philosophy 101.

A peer tutoring program is in place.

Emily Carr College of Art & Design

Critical thinking, creative thinking and problem-solving techniques are emphasized in Senior Seminar Courses in Contemporary Art & Design and in the Creative Processes Course in the first-year program. The Design course in particular stresses problem-solving techniques.

Fraser Valley College

A course called "Reasoning" is offered by the Philosophy Department and is recommended to students by the Social Services Program and Criminal Justice Program.

Moira Gutteridge has written "Thinking Critically About Technology." This is a structured sequence of assignments for developing a critical evaluation of an issue and is used in the Women's Introduction to Technology Program.

Wendy Watson and Moira Gutteridge have written a guide for instructors called "Teaching Basic Literacy Students to Think Critically About Issues in the News." It contains question grids used for prompting readers to improve reading and thinking and can be used at all levels of the literacy program.

Fraser Valley College, with funding from a Locally Initiated Curriculum Development Grant, is developing a Writing Across the Curriculum program co-ordinated by the Communications and English Departments and involving a core group of interested faculty. Its goal is to create a structure which follows up and reinforces what is learned in writing courses with developmentally structured writing classes in all disciplines. Specific activities included:

1. A visit by faculty to colleges in Washington State to investigate writing across the curriculum approaches there.

2. Three workshops :

"Designing & Sequencing Assignments to Meet Course Objectives Across the Curriculum" presented by faculty from the University of Puget Sound's Writing Centre, Math, and History Departments;

"Creative Marking of Student Assignments" presented by Virginia Cooke and Cheryl Dahl;

"One-to-One Conferences with Students about Writing."

3. Distribution of a booklet about writing assignments that instructors at the College use.

4. Formulation of a policy statement to be published in the College Calendar about literacy expectations for students.

5. Creation of standard guidelines for documentation in essays, particularly research papers.

Longer term goals:

1. Creation of a Writing Centre

2. Offering prizes for student essays

3. Honouring faculty writing

Kwantlen College

Informal attempts are made to incorporate critical thinking in History, Political Science, Fine Arts, Environmental Studies, Languages, Psychology, English and Philosophy. Critical thinking, informal logic and creative thinking are emphasized in Economics. Formal and informal logic as applied to English argument are part of Philosophy 150.

Kwantlen is working towards developing more courses in critical thinking and is investigating the Tunxis Community College Program as a possible model. Ron Kinley, presently on educational leave, is exploring critical and creative thinking.

Kwantlen's Centre for Innovative Education uses Gerry Ehman's (Selkirk) materials on Study Skills Across the Curriculum and Joanne Kurfiss' on Writing Across the Curriculum. The Centre is a resource for faculty and operates without release time for those involved.

Various faculty are trying out Writing Across the Curriculum approaches. Learning Process Journals have been introduced by Psychology faculty. In the Technology Program, most of the writing is assessed by the technical

writing instructor as a piece of writing and by the instructor who assigned it as a technical document.

Malaspina College

Informal logic is a component of Philosophy courses.

Critical thinking is included informally in Adult Basic Education English 047/067. Wasserman's "Thinking Box" is used. Teaching packages on problem-solving and logic are integrated into the Learning Centre.

Through the Liberal Arts Department, special release time (1/2 FTE) is provided for developing less traditional approaches to writing instruction. Informal meetings are held between the English faculty and other disciplines to discuss concerns about writing. Professional development seminars are provided and some courses are designated as writing-intensive. A Writing Centre assists students in all curricular areas.

College of New Caledonia

At the College of New Caledonia, thinking skills are informally integrated into various courses. Microcomputers and a Developmental Study Centre which emphasizes an individualized approach are used to improve students' learning through reading and writing. Variable amounts of release time are provided. Faculty meetings are conducted to discuss writing concerns.

Northern Lights College

Problem-solving techniques are taught. Informal attempts have been made to introduce critical thinking across the curriculum.

An institutional writing committee has been established and meetings between disciplines and English faculty have taken place to discuss various writing concerns at the College.

Northwest Community College

Toulmin logic is taught in English 101-2 using Open to Language and Elements of Argument. Informal meetings are held between discipline areas and English faculty to discuss writing concerns. Reading and writing instruction are linked in English classes. Cloze passages are used as

diagnostic tools. The text The Writing Process by John Parker (Langara) is used.

Okanagan College

In the Arts, critical thinking and informal logic are taught and a number of seven-week, two-hour remedial reading and writing classes are held. There is also a Writing Centre.

Critical thinking and problem-solving techniques are used in developmental programs. Developmental Program Faculty hold informal gatherings to discuss writing concerns and take part in professional development seminars on this topic. Writing intensive courses and adjunct writing classes are provided. Don Sawyer of the Salmon Arm campus wrote an ABE English Resource Kit for the Ministry of Advanced Education and is applying the results of his research in the classroom.

Informal gatherings are held between discipline areas to discuss writing concerns. Writing-intensive courses are held with high expectations on writing emphasized. Peer tutoring programs are in place and professional development seminars and workshops on improved learning through writing have been held.

Selkirk College

In Selkirk's English Department, courses in composition and literature feature various aspects of thinking skills as a focal part of the course content. Critical and creative thinking, as well as informal logic and problem-solving techniques, are involved. A heavy focus on critical thinking skills is evident in Biology courses and in some Nursing and Maths classes. Critical thinking has been discussed, both formally and informally, at Selkirk and a study was conducted by Gerry Ehman in the Social Sciences/Human Services Department.

Selkirk College uses the work of Joanne Kurfiss in course development as well as the Dialectical Journal. Group writing is practised in composition classes and peer evaluations are conducted for various assignments. Cooperative marking is used by two departments. English faculty meet informally with faculty in other disciplines to discuss writing concerns. Some courses have increased writing expectations. Professional development seminars on reading, writing, and thinking across the curriculum are organized by the Professional Development Committee. A Writing Centre and peer tutoring program are also supported by the college.

Vancouver Community College – King Edward Campus (KEC)

Mathematics, Humanities and Business Departments include thinking skills instruction in their courses. Problem-solving, role playing, and simulation exercises are used in courses such as English, Canadian Viewpoints, Geography, Economics, and History. Sonja Alton conducted an informal study when teaching in both Mathematics and Humanities. She investigated why some students were better at symbolic communication and others do better at oral and written communication.

In Basic Training Skills Development, reading workshops are held on inferencing and other strategies for comprehension. Creative thinking is practised in Life Skills through the use of games. Topics such as newspaper analysis, critical analysis and how to present an argument are components of Writing classes.

Faculty at King Edward, especially those in Humanities and BTSD, frequently use innovative methods of assigning and evaluating writing and reading. Individualized, self-paced, computerized modules are used to improve student reading and writing skills and some release time is provided for development. Faculty meet informally between discipline areas to discuss writing concerns and attend professional development seminars on this topic. Some writing-intensive courses and adjunct writing classes attached to courses in other disciplines are offered. A Writing Centre supports student writers in all curricular areas.

Several English as a Second Language departments make use of CBC transcripts and tapes to bring currency and vitality to the language skills of listening and reading simultaneously. Some use daily newspapers and the Westcoast Reader for writing/thinking discussions. KEC has introduced a number of courses in academic areas for ESL with the object of teaching subject content and language acquisition simultaneously.

Vancouver Community College – Langara Campus

Philosophy 104, a course designed to teach students how to read critically, is offered. In the Career Centre, programs involve students in analysis of case histories and examinations of policy and procedure structures. Problem-solving techniques are taught in Nursing Practices and Diagnosis.

A Writing Centre is available for all students and tutorials are also accessible. Peer tutoring is used by some English instructors. A recommendation has been brought forth by the English Department to implement a Writing Fellows Program.



CONCLUSIONS

Challenges

As post-secondary educators meet the challenge to prepare their graduates for successful participation in an information age society, they are faced with increasing needs for professional development. Subject specialists need opportunities to remain current in their own discipline. In addition, they are not only required to cope with increasingly varied student needs but must also respond to expectations of employers for graduates to be able to read more efficiently, communicate more clearly, and reason more effectively. Few subject teachers have the necessary training to teach students how to do this.

The quiet revolution taking place in post-secondary classrooms across the continent confirms that, given appropriate training, teachers in all subject areas can make a difference in student learning. By ensuring students are actively engaged in the reading, reasoning, and writing processes of their subject, teachers across the disciplines are contributing to improved student learning.

Changing Teaching Approaches

The change cycle typically involves the following three stages, all of which must be negotiated one way or another before a real change has indeed occurred:

1. Recognition or creation of motivation to change.

2. Developing new attitudes and behaviours on the basis of new information and new ways of looking at old information.
3. Stabilization of the change (Schein 243-247).

In the first stage, instructors may find some of their present classroom teaching or attitudes no longer appropriate. They may discover that many of their assumptions about how students learn are not valid or that their present teaching is not leading to expected outcomes. Instructional change will occur only when an instructor feels safe to give up old methods and willing to try something new. Having decided to engage in some thoughtful application of a new teaching practice, individuals and groups need direct experience with it. Trial is crucial in the change process (Joyce and Showers 380).

It is in this second stage, as they try out new approaches, that support for change becomes essential, both from peers and administrators. At this stage, it is also important for teachers to have a rationale or theory that underlies and supports their teaching practices. Along with presenting practical teaching approaches, across-the-curriculum instructional development programs need to provide enough information about language and learning theory to allow teachers to adequately explain both their successes and failures (Britton 187).

In an effective instructional development model, the role of a "change agent" is crucial (Schein 245). One function of a change agent is to demonstrate new approaches and to provide continuing support for instructors trying out new practices. Cooperation with this person (or group) occurs when the target group is voluntary, trusts the change agent, and faces no enforcement of change. Resistance generally occurs when change agents emphasize an official role, when a group is captive, feels threatened or helpless, or when change is mandated (Gere and Smith 29). As described in the Background section of this report, the Bay Area Writing Project has demonstrated that successful classroom instructors are the best change agents.

Often attitudinal changes have observable effects during an initial training period but do not last once a teacher is back in a normal routine (the usual complaint about one-time workshops). This often happens because new approaches either do not fit into the person's total personality or are out of line with the work setting and relations with colleagues. To ensure the stability of instructional change, therefore, specific attention must be paid to the integration of new teaching approaches. In this consolidation stage, team endeavours are more powerful than individual ones. Although requiring more give-and-take that make initial steps slower, their impact lasts longer as group members are able to support each other in implementing new strategies.

As part of the integration stage, teachers need to make a clear connection between how they teach and what students learn. They need to evaluate the effectiveness of their instruction by collecting feedback on what and how well their students are learning. In this process, the classroom becomes both a teaching and a research environment, a place where pedagogical questions themselves become agents of change (Goswami and Stillman). Patricia Cross encourages college teachers to become classroom researchers, pointing out that they can become revitalized in the process. Cross emphasizes that classroom-based research, designed, conducted, and used by teachers themselves, is self-adjusting to the level of interest and expertise of the teacher. Unlike most educational research, the findings of classroom-based research have direct relevance to the teacher and can be used to improve practice. In pressing for classroom-based research, Cross proposes that "thousands of small changes made in classrooms . . . may well add up to more real reform of education than sweeping policies made far from the scene of the teaching/learning action" (499).

Anecdotal reports from faculty participating in successful writing and critical thinking programs testify that when they use learning approaches, classrooms become communities of learners. They also vouch for increased student motivation and their own sense of revitalization. In incorporating student-centred interactive language and thinking approaches in their instruction, however, many instructors begin to question not only their own actions, but, more importantly, their assumptions and attitudes. Of necessity, they change their view of their own role and the role of learners as their relationship with students change.

For institutions looking to effect positive pedagogical change, it must be cautioned that many instructors will initially feel uncomfortable and threatened when presented with new approaches to teaching in their subject areas. A supportive environment at all stages of the change cycle will be critical for implementing new classroom approaches.

Future Directions for Teaching Across the Curriculum in British Columbia

As individuals, departments, and entire institutions in the British Columbia college and institute system explore ways to improve student learning, lessons can be learned from the collective experience of colleagues and organizations elsewhere.

As stated in previous sections of this report, a comprehensive approach appears to be the key to effective instructional change: curriculum planning, course design, faculty development, integration of research, articulation with other levels of the educational system, and program assessment.

One area, however, that has scant experience for us to draw upon is that of subject-based reading instruction at the post-secondary level. If our colleges and institutes are to prepare students for the changing future in which independence in text learning will be increasingly important, instructional development programs will need to include components of content-based reading instruction. British Columbia can play a leadership role in providing such programs.

For those initiating instructional development programs to help teaching faculty incorporate reading, writing, and critical thinking instruction in their courses, the Bay Area Writing Project model offers a useful set of principles and practices. In an article entitled "Teacher Development and the Revolution in Teaching," Sheridan Blau looks back over the project's evolution and impact and attributes its success to its egalitarianism and its emphasis on direct teaching experience. The article describes the three stages of growth that have occurred as writing projects have matured:

1. The "Show and Tell" stage in which experienced and successful teachers show each other what they do and how they came to do it: what problems or experiences brought them to a particular practice and what reading informed or validated it.
2. The "Principled Practices" stage in which teacher-consultants in inservice programs explain the principles behind the practices they demonstrate in order to help other teachers adapt such practices to their own teaching situations.
3. The "Teacher Research" stage in which teachers reflect on their own teaching with the practical aim of perfecting practice (Blau 30-35).

In the preceding sections, writing, reading, and critical thinking instruction have been treated separately, but only because the volume of information, issues, and pedagogical approaches inherent within each demanded such treatment. The reader will realize, however, that, for graduates to be literate, thinking, responsible citizens, good teaching involves addressing these areas simultaneously in any classroom instruction. For British Columbia's colleges and institutes, forging links across disciplines will be crucial in preparing graduates for changing times ahead in an increasingly global community. In other parts of North America, successful writing and critical thinking faculty development programs have shown to be instrumental in forging such links.

In Washington State, interdisciplinary ventures have gained national recognition. Evergreen College is totally committed to interdisciplinary approaches to teaching and learning. Fostered by the Washington Center for Improving the Quality of Undergraduate Education, the number of

interdisciplinary "learning community" programs are increasing throughout the state and are viewed as having compelling and exciting answers, all at once, to many of the challenges which confront undergraduate education today:

1. The need for students to be engaged in more active learning, and to have greater intellectual interaction with one another and with their faculty. . . .
2. The need for faculty to have greater intellectual interaction with one another. . . .
3. The need for less fragmentation, and greater coherence for students in the general education curriculum. . . .
4. The need for . . . college curricula to address issues which cross-subject matter boundaries. . . .
5. The need for students to explore and understand diverse perspectives. . . .
6. The need to stem the tide of student attrition. . . .
7. The need for creative and low-cost approaches for faculty development. . . .
8. The need to address all of the above problems in times of fixed or shrinking budgets (MacGregor 7-10).

The recommendations that follow address the needs of the college/institute system at a time when interest is growing in subject-based instruction of communication and intellectual reasoning skills. They are intended to complement discipline-based professional development designed to help faculty remain current in their field. The quiet revolution that is occurring across the continent has shown that no single approach is sufficient and that a grassroots model is essential for change to occur where it must — in the classroom. Autonomy of instructors and diversity of educational tasks must be respected and the expertise that is already present needs to be recognized and tapped. At the same time, a system-wide approach is necessary for resources and information to be shared. Discussion across disciplines is needed for commonalities to be shared; communication across institutions is needed to help discipline areas develop subject-based instruction of reading, critical thinking, and writing. Both are necessary and both require resources.



RECOMMENDATIONS FOR THE BRITISH COLUMBIA COLLEGE AND INSTITUTE SYSTEM

The recommendations that follow in this section are based on examination of:

- Existing writing and critical thinking across the curriculum models;
- Responses to the questionnaires sent to all colleges and institutes in British Columbia;
- Restraining and enabling forces currently at play in the British Columbia college and institute system;
- Findings contained in the report Developing the Human Dimension (Morin);
- Research on the change process as reported by Edgar Schein, organizational psychologist at the Massachusetts Institute of Technology (Schein 243-248);
- The Joyce and Showers (379-385) model for effective inservice training for classroom teachers.

Recommendation I: Five-Year Commitment

It is recommended that individual institutions and the Ministry of Advanced Education and Job Training (hereafter referred to as the Ministry) make a five-year commitment to provide resources for instructional development for subject-based teaching of reading, critical thinking, and writing.

Discussion:

The case has been made in this report for faculty in all disciplines to incorporate reading, critical thinking, and writing instruction in their courses in order to prepare students better for the challenges of the future.

For teachers to change current classroom practices in order to have substantive impact on student achievement, an effective instructional development program is critical. Faculty first need to develop awareness of the importance of their role in improving students' communication and thinking abilities. This then has to develop into knowledge of new principles and skills which are subsequently transferred to teaching strategies and actual practice. Instructors need information and support in order to bridge the gap between old and new, between theory and practice. Such changes do not occur suddenly.

Successful writing and thinking across the curriculum models have involved a multiplicity of interrelated initiatives in curriculum planning, course design, faculty development, articulation, research, and assessment. While invaluable on the small scale, informal efforts, relying only on the initiative of individual instructors or on occasional instructional development workshops, have not had significant impact. Any instructional development program undertaken should be based on long-term commitment at the institutional level and supported system-wide by the Ministry. It should consist of financial support as well as the building of an environment which encourages innovation.

Recommendation II: Institutional Support

It is recommended that each institution support instructional development programs in teaching reading, critical thinking, and writing across the disciplines.

Such programs should include:

1. Building awareness of the need for instructors in all areas to teach reading, critical thinking, and writing.
2. Identifying and supporting a core group of instructors who will receive training and who will serve as catalysts for instructional development within the institution and possibly across the system.
3. Recognition of the time faculty need for attending seminars and for course preparation when incorporating new instructional approaches to include reading, thinking, and/or writing activities.

Discussion:

Institution-based reading, thinking, and writing across the curriculum programs, if they are to have real effects on students, must be supported by the organization in which they occur. It will be important for institutions to develop awareness of and commitment to subject-based instruction of reading, critical thinking, and writing skills. The awareness-building process should involve establishing a college-wide committee as well as workshops in which issues are discussed and successful approaches are shared.

The functions of core groups of trained faculty at participating institutions would include:

- a. Working with faculty and administrators to develop reading, critical thinking, and writing awareness.
- b. Supporting classroom innovations of instructors who seek feedback and guidance.
- c. Coordinating development of the institution's curricula with regard to reading, critical thinking, and writing outcomes.
- d. Facilitating ongoing articulation of reading, thinking, and writing instruction with other institutions, including the secondary level.

The core groups would take advantage of unfocussed but already existing interest in the institutions.

The recently completed report Developing the Human Dimension shows that instructors would welcome faculty development activities which would have "immediate, practical application to the job" and a "personal sense of renewal and refreshment." As indicated in earlier sections of this report, the Faculty Development Model of Writing and Critical Thinking Across the Curriculum has resulted in positive changes in faculty attitudes and a sense of renewal. However, as a result of the sustained growth in enrollment during the 1980s, juxtaposed with funding restraint, many faculty are, or perceive themselves to be, already overworked. In either case, it will be difficult to gain necessary interest and cooperation among faculty at large unless steps are taken to meet this concern. While some will undoubtedly embrace the goals and techniques of reading, critical thinking, and writing instruction, others may view them as desirable but impractical chores in an already overcrowded day.

A parallel argument can be mounted with respect to administrators. If a steady development of across-the-curriculum initiatives is to be maintained, funding and time release will be required for the involvement of administrators as well.

Recommendation III: Ministry Funding

It is recommended that the Ministry provide direct funding for institutional projects and for the development of a coordinated approach to instructional development for improving teaching of reading, critical thinking, and writing skills across the curriculum. This funding should provide for a five-year project under the leadership of a project team and could be administered by the Development Centre.

Specific activities of this project would be:

- funding institutional-based projects to implement across-the-curriculum activities.
- arranging annual regional faculty development workshops in order to
 - train core groups of instructors at each participating institution who will act as catalysts to introduce subject-based teaching of reading, critical thinking and writing.
 - ensure “cross-fertilization” of successful approaches.
 - provide opportunities for discipline-based workshops as increasing numbers of instructors incorporate new instructional approaches.
- arranging for one major conference each year for the duration of the project on the topic of reading, critical thinking, and writing across the curriculum.
- publishing at least four newsletters per year as well as creating and managing a continuing electronic conference.

Discussion:

As discussed under Recommendation I, institutional and Ministry resources will need to be committed for across-the-curriculum implementation of reading, critical thinking, and writing instruction. While it is expected that institutions would provide funding for basic instructional development activities, it is apparent that that additional funding would have to be provided by the Ministry for special projects.

Although it is recognized that each institution should set its own priorities for instructional development, Developing the Human Dimension Report points out the practicality of having system-wide services. The focus of such a coordinated approach would be to

- complement and enhance faculty development opportunities made available to individuals.

- assist in equalization of access.
- facilitate communication and cooperative endeavours.
- provide focussed liaison with the broader community.

A project team would provide an important focus for what might otherwise be uncoordinated attempts by individual educators, or at most by individual institutions. This team could ensure a relatively systematic approach, while encouraging the efforts of individuals.

The functions of the project team would include:

- arranging for regional workshops and annual conferences.
- providing ongoing support to core groups at participating institutions.
- helping instructors conduct classroom-based research into
 - a. pedagogical techniques which enhance writing, thinking and reading abilities.
 - b. the effects of writing, reading, and thinking instruction on student achievement, job placement and other indices of educational effectiveness.
- coordinating development of model course-materials, assignments, classroom techniques, etc., which promote reading, critical thinking, and writing, and making these available to other interested educators.
- liaison with educators within the system and outside the province concerning across-the-curriculum instruction and related concerns.
- coordinating liaison between the post-secondary and secondary levels of the system with a view to enhancing incoming students' reading, critical thinking, and writing abilities and motivation.
- publishing a regular newsletter.

The three specialists would provide necessary process and theoretical expertise of their field. With the Development Centre, they would initially deliver regional training workshops for the core faculty at participating institutions. It is suggested that the critical thinking specialist work closely with the British Columbia Association for Critical Thinking Instruction and Research (ACTIR) which has assembled a broad range of expertise in this area. Eventually, the role of the project team would be predominantly consultative as trained faculty in institutions take on workshop leadership roles in their own institutions and region.

Content of workshops would include a combination of theoretical knowledge and practical strategies for implementing reading, critical thinking and writing instruction in subject area classrooms. It has been found that successful models are often based on summer institutes for faculty either on a single campus or at regional sessions with follow-up meetings spaced throughout the school year. This results in each campus having a core of trained faculty. In subsequent years, the aim for the regional workshops would be "cross-fertilization" of successful approaches and increasing numbers of discipline-based workshops. It could be expected that the trained core faculty would travel to present workshops in other regions to ensure cross-fertilization.

Major conferences in which presentations focus on successful classroom practices and relevant theory serve a useful function in effecting instructional change. They offer individuals and groups opportunities to scan for information among multiple sources. What is learned by scanning fits by definition, since only relevant information is used. Discussions across and within disciplines and the networking that occurs at major conferences are important for generating interest and new information. Instructors need the stimulation and reassurance of discussing with colleagues and learning from experts. While classroom activities are the actual fruits of instructional change, it is at professional conferences that many seeds are sown and nourished.

Increasingly, professional networks are reaching out, providing and gathering new information. While the electronic mail system is having an ever-increasing impact, it will still be important to have a paper communication link for instructors to share information, ideas, and concerns.

Recommendation IV: Curricular Change

It is recommended that educational planning and policy both at the institutional and system level continue to emphasize the development of curricular change to incorporate the teaching of reading, thinking and writing skills.

Discussion:

While it is not within the scope or mandate of this report to make recommendations on curricular change, it is nevertheless apparent that educational planning and policy both at the institutional level and system level need to continue to emphasize the development of reading, thinking, and writing abilities of students. It is cautioned, however, that centralized attempts to introduce important changes in curriculum planning and pedagogical technique would probably founder. No formulaic solution exists

to the educational problem of improving reading, critical thinking, and writing abilities across the curriculum. On the contrary, grassroots discussion and development of appropriate policies and techniques is crucial to effecting change.

Recommendation V: Modes of Instruction

It is recommended that institutions examine, implement, and evaluate innovative modes of instruction which enhance learning such as:

- collaborative learning
- peer tutoring
- individualization as provided by faculty-supported writing and critical thinking centres
- interdisciplinary teaching

Discussion:

The main rationale for these modes of instruction has been discussed earlier in this report. The point which needs to be made here is that, while a certain amount of autonomy over classroom activities is held by the instructor, institutional limitations often prevent the full exercise of critical thinking, reading, and writing instruction. The demand for "productivity," for example, leads to an increase in class size, which tends to be antithetical to enhancing critical thinking outcomes and improved writing abilities. Therefore, only if the appropriate modes of instruction are adopted at the level of the institution will there be real success in developing the reading, thinking, and writing abilities of students.

Recommendation VI: Liaison with Secondary Schools and Universities

It is recommended that colleges and institutes play a leadership role in building cooperation among secondary and other post-secondary levels concerning comprehensive reading, critical thinking, and writing approaches.

Discussion:

The Bay Area Writing Project (BAWP) offers a further set of successful practices that have not been examined in this report but which deserve attention from those interested in enhancing student learning: collaboration between colleges, universities, and their feeder high schools (Gray 35-45). Sharing common goals and concerns, university, college, and high school teachers in all subject areas play a crucial role in improving student learning and easing their transitions to the workplace or to further study.

Teachers at all levels and in all subject areas are prone to making assumptions — some accurate, some erroneous — about the reading, critical thinking, and writing tasks students are able to accomplish independently. Such assumptions are often the cause of frustration for both students and teachers. As the Dawson College Literacy Across the Curriculum program demonstrates, community colleges can play an important leadership role by providing a meeting ground for discussions around issues of effective teaching and learning. The BAWP Writing Project model has proven that teachers at all levels will benefit from collaborative goal setting and instructional development activities.

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APPENDIX A

Basic Assumptions Underlying the Bay Area Writing Project

1. The universities and the schools must work together as partners in cooperative-collaborative effort to solve the writing problem; the "top-down" tradition of past school-university programs is no longer acceptable as a staff development model.
2. Successful teachers of writing can be identified, brought together during university summer institutes, and trained to teach other teachers in follow-up programs in the schools.
3. Teachers themselves are the best teachers of other teachers; practicing classroom teachers have a credibility - a believability - no outside consultant can match.
4. The summer institute must involve teachers from all levels of instruction, elementary school through university; student writing - if it is to be improved - needs constant attention from the early primary grades on through the university.
5. The summer institutes must involve teachers from across the disciplines; writing is as fundamental to learning in science, in mathematics, in history as it is in English and the language arts.
6. Teachers of writing must write themselves; teachers must continue to experience what it is they are asking their students to do when they ask them to write; the process of writing can be understood best by engaging in that process firsthand.
7. Real change in classroom practice happens over time; effective staff-development programs are ongoing and systematic programs that make it possible for teachers to come together regularly throughout their careers to test and evaluate the best practices of other teachers.
8. What is known about the teaching of writing comes not only from research but from the practice of those who teach writing.

from: James Gray. "University of California, Berkeley: The Bay Area Writing Project and the National Writing Project." School-College Collaborative Programs in English. Ed. Ron Fortune. New York: Modern Language Association of America, 1986: 35-45.

APPENDIX B**Covering Letter to Writing, Reading and Critical Thinking Survey
(Questionnaires sent to Deans of program areas at all colleges
and institutes in British Columbia.)**

Dear XXXX

As a member of the Instructional Development Advisory Committee (IDAC), I am writing to ask for your assistance in helping me gather information about the teaching of reading, writing, and thinking across the curriculum at your institution.

As you may know, IDAC was established by the Council of Principals in 1986 to examine issues related to instructional development in the B.C. colleges and institutes. In its report of June, 1987, it identified the subject-based teaching of reading, writing, and thinking skills across the curriculum as a possible area for future professional development activities throughout the system. Subsequently, the Ministry agreed to support the development of an investigative report on this topic. The intent of the report is to:

- (a) summarize the current research and literature about the relationship between student achievement and subject-based teaching of writing, thinking, and reading skills;
- (b) describe the present status of writing and critical thinking across the curriculum in our colleges and institutes;
- (c) describe a selection of successful program models outside the province; and
- (d) describe alternatives for instructional development opportunities in individual institutions as well as across our college and institute system.

Last October, the National (U.S.A.) Network of Writing Across the Curriculum Programs conducted a survey throughout North America on writing across the curriculum. It is my understanding that few Canadian programs were identified. Although your institution may not have a formal writing and/or thinking across the curriculum program, you may have instructors who are integrating the teaching of writing, reading, or thinking skills within their curriculum. You may also have some joint ventures between English or Communication instructors and those in other areas. Would you please pass along the attached questionnaires to whomever they might apply. Their cooperation will be much appreciated. Feel free to make additional copies if required.

Thank you in advance for your kind assistance in this matter. If you have any concerns or questions about this request, please do not hesitate to contact me. My phone numbers are: 984-4919 (college); 922-0995 (home).

Sincerely,

Ruth D'Hollander
Coordinator, Achievement Resource Centre

APPENDIX C

Writing and Reading Across the Curriculum Questionnaire

1. Is your institution/department making attempts to improve student learning through more frequent, less traditional approaches to assigning and evaluating writing and/or reading assignments?

Yes ____ No ____

If "Yes", please explain and provide the name of a contact person:

2. Is special release time or support provided to develop this approach to instruction?

Yes ____ No ____

If "yes", how much and of what kind?

3. Which "Writing Across the Curriculum" approaches apply to your institution/department?

1. CIRCLE as many as apply; 2. MARK WITH AN "X" those you would like to see implemented;

3. MARK WITH "XX" those you would like to know more about.

- a. Writing Centre or tutorials for students from all curricular areas
- b. Writing Across the Curriculum Advisory Committee
- c. Institutional or departmental writing committee
- d. Informal gatherings between discipline area(s) and English faculty to discuss writing concerns
- e. Writing-intensive courses with increased written expectations
- f. Adjunct writing classes attached to courses in other disciplines
- g. Peer tutoring programs
- h. Professional development seminars/workshops on improving learning through writing and/or reading.
- i. Other (please specify)

4. If there is a unique feature of your writing and/or reading across the curriculum program which these questions have not brought out, please describe on the back of this sheet.

PLEASE RETURN YOUR COMPLETED QUESTIONNAIRE TO

RUTH D'HOLLANDER

Achievement Resource Centre, Capilano College, 2055 Purcell Way,
North Vancouver, B.C. V7J 3H5

FOR FURTHER INFORMATION CALL RUTH AT: 984-4945 OR 922-0995.

APPENDIX D**Thinking Across the Curriculum Questionnaire**

1. Which of the following types of courses/workshops that focus on thinking skills does your institution offer? Please **CIRCLE** as many as apply.

- a. Critical thinking
- b. Informal logic
- c. Creative thinking
- d. Problem-solving techniques
- e. Other

For any you have circled above, please provide details and the name of a contact person

2. Has your institution formally introduced critical thinking as a component in teaching across the curriculum?

Yes ____ No ____

3. Have there been informal attempts to introduce critical thinking as a component in teaching across the curriculum?

Yes ____ No ____

4. Has anyone in your institution conducted a study (formal or informal) into the effects of improved critical or creative thinking abilities on student achievement as a result of any approaches described above?

Yes ____ No ____

If "Yes", please explain

PLEASE RETURN YOUR COMPLETED QUESTIONNAIRE TO

RUTH D'HOLLANDER

**ACHIEVEMENT RESOURCE CENTRE, CAPILANO COLLEGE, 2055 PURCELL WAY
NORTH VANCOUVER, B.C. V7J 3H5**

FOR FURTHER INFORMATION CALL RUTH AT 984-4919 OR 922-0995

APPENDIX E**Critical Thinking Questionnaire**

This questionnaire is about the effects of critical thinking training on your other courses. Please answer the following questions with those in mind. Circle your answer.

- 1) Do you consider that your training in Critical Thinking has helped you in your other studies?
Yes ____ No ____
- 2) Would you say it has helped you a great deal?
Yes ____ No ____
- 3) Does Critical Thinking training help you to make greater sense of reading materials from other courses?
Yes ____ No ____
- 4) Does Critical Thinking training help you to structure your written assignments in a clearer way?
Yes ____ No ____
- 5) Do you think it's likely that your overall grades have increased or will increase as a result of Critical Thinking training?
Yes ____ No ____
- 6) Do you think it's certain that your overall grades have increased or will increase as a result of Critical Thinking training?
Yes ____ No ____
- 7) Would you recommend Critical Thinking training to other students as a way of increasing academic achievement?
Yes ____ No ____